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FINANCIAL SECURITY OF THE ENTERPRISE: AN ALTERNATIVE APPROACH TO EVALUATION AND MANAGEMENT

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Abstract. *Purpose* – The main purpose of the article is to justify an alternative approach to assessing the level of financial security of the enterprises based on use the model of modified and adjusted financial statements.

Research methodology – The following methods of general theoretical and empirical research were used in the writing of the article: abstract-logical (when systematizing scientific publications on the problems of financial security management of enterprises), comparisons and grouping (when developing and validating a model of modified financial statements), coefficient (when considering and using models for adjusting modified financial statements), grouping (when clustering enterprises depending on the results of the analysis), formalization (when developing a matrix for diagnosing the level of financial security of enterprises), generalization (when formulating research findings).

Findings – Based on an established sample from nine of sunflower oil production enterprises of Ukraine their modified financial statements have been developed, it was adjusted to the consumer price index, key financial indicators of the model have been identified and the level of their financial security over the past 7 years have been assessed. The research identified a direct relationship between the level of financial security of enterprises and key financial indicators: financial stability, solvency and financial risk. Also, the proposed methodological approach can be not only an important tool for diagnosing the level of financial security of enterprises, but also its forecasting.

Research limitations – The research limitation is associated with sampling size and geographical scope. Also, the diagnostic results may differ depending on the chosen adjustment base, determination of adjustment method and selection of inflation measurement method for the modification financial statements.

Practical implications – Practical use of the proposed model proves that it is a convenient, simple, understandable and effective tool for diagnosing the financial security level of enterprises in terms of the main components: financial stability, solvency, and risk. The use of the proposed approach to the assessment of the financial security of the enterprise can serve as an indicator of the overall efficiency of its management at sunflower oil production enterprises and as an informative tool for factor analysis.

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Originality/Value – Consideration of a significantly different, alternative approach that allows enterprises to quickly and easily diagnose the level of their financial security; to manage it effectively during the current period, and can also become the basis for the formation of strategic directions of financial development and forecasting of the level of financial security for prospective period.

Keywords: financial security, modified and adjusted financial statements model, financial stability scale, solvency scale, financial risk scale.

JEL Classification: G32, M2, Q10, Q14.

Introduction

Financial security is a complex, multi-level economic category characterized by the interaction and interrelatedness of all its elements: the level of financial security of the state is one of the main general prerequisites for ensuring the financial security of its components; conversely, the effectiveness of financial security management at each level and each component affects the overall financial security of the state.

In general, the financial security of an enterprise is the level of the financial security of the enterprise sufficient to meet its needs and meet its obligations which characterized of balance, resilience to internal and external negative impacts, ability to reverse external financial expansion, financial sustainability, efficient functioning and economic growth (Baranovs'kyy, 2004).

One of the most problematic and debatable processes for today is the process of diagnosing and assessing the financial security of an enterprise. In the various spheres of activity of enterprises, a comprehensive assessment of the level of their financial security is very complex from a methodological point of view and almost always raises controversial questions among scientists and practitioners.

Research on this issue suggests that the methodological approaches used as a basis for financial security analysis and management have not lost their relevance for today but need further improvement.

Scientific works are devoted to the justification of modern methodological approaches to the assessment of the level and position of the financial security of an enterprise are: Azarenkova et al. (2018), Britchenko et al. (2018), Khudoliei (2018), Hryhoruk et al. (2019), Kosaynova et al. (2019), Drobyazko et al. (2020), Franchuk et al. (2020), Kharchuk et al. (2020), Kondratenko et al. (2020), Sylkin et al. (2020).

The main approaches to estimating the level of financial security of the enterprise, which are currently presented in the professional literature – are the coefficient, which involves the calculation of a set of financial indicators (Delas et al., 2015; Yeletskykh, 2017; Pera, 2017; Kharchuk et al., 2020); integrated, based on the definition of an integrated indicator of financial security (Ganushchak, 2017; Khudoliei, 2018; Azarenkova et al., 2018; Kosaynova et al., 2019; Kharchuk et al., 2020); based on the diagnosis of the probability of bankruptcy (Valaskova et al., 2020; Sylkin et al., 2018, 2019, 2020; Koleda & Lāce, 2008; Bilomistniy et al., 2017; Britchenko et al., 2018; Nguyen & Nguyen, 2020; Franchuk et al., 2020). There are also several author's methods for assessing financial security: Hryhoruk et al. (2019) – model for assessment of the financial security level of the enterprise based on the desirability scale; Zwolak (2017) – empirical model based on the Cobb-Douglas power function.

In our opinion, the establishment and implementation of an effective financial security management process in enterprises require new approaches to their organization. The quality and soundness of the management decisions made at each stage of an enterprise's financial security management depend to a large extent not only on the reliability, completeness, accessibility and timeliness of the information as well as the effectiveness of evaluation and analytical methods and methodologies used.

Accordingly, the improvement of methodological approaches to diagnosing the level of financial security of an enterprise is one of the key points for improving the efficiency of the whole process of its management which in turn will enable to ensure its competitiveness and investment attractiveness and raise market costs.

The author's previous research has established that the following methodological approaches are useful for diagnosing the financial security level of an enterprise at the present stage: classical financial analysis tool, financial stability assessment tool and value-based management tools (Dokiienko et al., 2020).

This article focuses on improving the direction "financial stability assessment tools" – justification the information and methodological support for the diagnostic and financial security management process of an enterprise through the use of a modified and adjusted financial statements model.

Abryutina's work was used as a basis for structuring the assets and capital of the enterprise and determining the overall level of financial stability of the enterprise on this basis of Abryutina (2002). Since financial sustainability is an essential component and a prerequisite for the financial security of an enterprise, it is proposed that this model be adapted precisely to diagnose the level of financial security of an enterprise. Besides, the methodology has been brought into line with modern financial reporting standards in Ukraine and has been improved through the implementation of an inflation factor adjustment, is supplemented by a scheme for assessing the level of financial security on the basis of the enterprise's position on the scale "financial sustainability – solvency – risk".

So, the main objectives of the study are:

- to establish a methodology for the development of modified financial statements of an enterprise, taking into account the peculiarities of Ukrainian standards for the compilation and presentation of information in financial statements;
- consideration of the methodology for adjusting the modified financial statements model required by the high inflationary impact on the performance and financial performance of Ukrainian enterprises;
- testing of the proposed methodology for the diagnosis of financial security level with the example of Ukrainian sunflower oil production enterprises.

The modified and adjusted financial statements model tested sunflower oil production enterprises as the oil-and-fat industry of Ukraine is one of the leading and mobile in the agribusiness complex of the country. Ukraine ranks first in the world in the production of sunflowers covering one-third of the world market. The largest share is in the production of raw sunflower oil, 95% of which is exported. 64 processing plants, 48 oil production plants, exports to more than 120 countries and $350 million in investments – all this is the oil-and-fat industry today. Ukraine produces an average of 6,400,000 tons of oil per year, 6 million of which are exported and this is 60% of world exports (GrowHow.in.ua, 2020).

According to the author, one of the most important conditions for the formation of positive results of operating activities of sunflower oil production enterprises and ensuring their sustainable growth while maintaining the desired financial condition is the existence of an effective system of financial security.

The problem of ensuring the financial security of sunflower oil production enterprises has become extremely important in recent years. This is due not only to the financial crises and the unstable financial and economic situation in the country but also to the constant variation in energy prices and the high dependence on agriculture which is seasonally based, environmental, climatic and biological factors; high resource intensity of the industry; export-commodity orientation, which makes external market positions unstable, as demand for commodities is volatile and subject to high price volatility; increasing the cost of banking services, etc.

Therefore, the executives of sunflower oil production enterprises faced the search for the most convenient, fast and easy to use approaches to diagnose their financial security level.

At the same time, out of the attention of scientists is the question of formation of appropriate methodological tools for assessing the financial security of sunflower oil production enterprises.

In the previous study, the author tested the classical financial analysis tool, namely the coefficient model for assessing the financial security level of sunflower oil production enterprises (Dokiienko, 2020), which is the most popular in modern financial diagnostic practice. The advantage of this model, along with simplicity and ease of calculation is that the consolidation of the results achieved has led to the development of a strategic financial position matrix for the domestic financial environment of sunflower oil production enterprises, as well as a matrix of possible strategic directions of their financial development, identifying the desired financial strategy within the framework of the desired level of financial security. But on the other hand, its use has also revealed a significant drawback – the different focus and even the contradictory results of the assessment of major groups of financial indicators make it very difficult to assess the financial security of the enterprise as a whole.

Accordingly, the importance of this study is that a model has been proposed for diagnosing the financial security level of an enterprise, which makes it possible to avoid this shortcoming. In addition, the uniqueness of the study is that empirically proven, that the proposed model of modified and adjusted financial statements makes it possible to assess the financial security of enterprise in a timely, convenient, accurate and as comprehensible manner as possible.

1. Literature review

Ukrainian scientists (Baranovs'kyy, 2004; Blank, 2004; Donets & Vashchenko, 2008; Yermoshenko & Horyacheva, 2010; Delas et al., 2015; Davydenko, 2015; Vergun & Topenko, 2016; Bilomistniy et al., 2017; Blakyta & Ganushchak, 2018; Ramskyi & Solonko, 2018; Khudoliei, 2018; Kondratenko et al., 2020 and others) and authors from other countries (Koleda & Lāce, 2008; Cernavskis, 2012; Pera, 2017; Zwolak, 2017; Mbatha & Ngibe, 2017; Safargaliev, 2019; Sylkin et al., 2020; Valaskova et al., 2020; Nguyen & Nguyen, 2020) have devoted a

considerable amount of their work to the issues of the substance of financial security as an economic category and the problems of its evaluation and provision. In fact, there has been increased interest in this category over the past few decades and remains relevant.

The most profound and thorough works for today are Baranovs'kyy (2004), who identifies several levels and dimensions of financial security: as a component of the economic security of the state; as a degree of security and security of financial interests at all levels of financial relations; as a state of financial, monetary, exchange rate, banking, budjet, fiscal, investment and other systems; the state of financial flows in the economy; the quality of financial instruments and services; Blank (2004), who considered in a comprehensive manner the main range of issues, both theoretical and methodological in managing the financial safety of the enterprise in the present circumstances; and Yermoshenko (2001), Yermoshenko & Horyacheva (2010), who have defined the methodological bases of financial security in the system of economic security at two levels of economic management of a country: states and enterprises.

Two key approaches to defining the nature of an enterprise economic security are highlighted in the current professional literature, which can be divided into two groups: as one of the components of an enterprise economic security (Yermoshenko & Horyacheva, 2010; Delas et al., 2015; Vergun & Topenko, 2016; Ganushchak, 2017; Blakyta & Ganushchak, 2018) and as an independent subject of financial management (Baranovs'kyy, 2004; Blank, 2004; Donets & Vashchenko, 2008; Koleda & Lāce, 2008; Davydenko, 2015; Bilomistniy et al., 2017; Rushchyshyn et al., 2017; Britchenko et al., 2018; Ramskyi & Solonko, 2018; Sylkin et al., 2018, 2019, 2020).

For the most part, scientists define the financial security of an enterprise as: the certain financial state of the enterprise characterized by appropriate resistance to external and internal threats (Blank, 2004; Delas et al., 2015; Bilomistniy et al., 2017; Davydenko, 2015; Rushchyshyn et al., 2017); the state of protection of the financial interests of the enterprise against various threats (Baranovs'kyy, 1999, 2004; Ramskyi & Solonko, 2018; Khudoliei, 2018; Franchuk et al., 2020); the risk management activities, i.e., in the context of crisis management of the enterprise (Sylkin et al., 2018, 2019, 2020; Nguyen & Nguyen, 2020); in the context of factors determining the financial security of the enterprise (Koleda & Lāce, 2008; Britchenko et al., 2018; Mbatha & Ngibe, 2017).

In the author's view, the most appropriate definition was made by Blank (2004), according to which the financial security of an enterprise is the quantitatively and qualitatively determined level of its financial state, which ensures stable protection of its priority balanced financial interests from identified real and potential threats of external and internal nature, the parameters of which are determined on the basis of its financial philosophy and create the necessary prerequisites for financial support for its sustainable development in the current and prospective period.

Scientists concerned with the financial security of an enterprise justify different methodologies and propose different sets of partial and aggregates indicators for assessing financial security depending on the level of application of this concept. The main approaches to assessing the financial security of an enterprise which are now presented in the professional literature, can be presented as follows.

Authors, which assessing the financial security of the enterprise based on the overall financial state of an enterprise, that is calculates and analyses key groups of financial indicators: profitability, business activity, solvency, financial stability, the efficiency of cash flow management (Blank, 2004; Delas et al., 2015; Yeletskykh, 2017; Pera, 2017; Kharchuk et al., 2020).

Ganushchak (2017), Khudoliei (2018), Azarenkova et al. (2018), Kosaynova et al. (2019), Kharchuk et al. (2020) offer to assess the financial security of the enterprise based on the definition of a generic integral measure of the financial security of an enterprise, based on the use of the different set of financial indicators and the determination of the relevant weights (limit values) for each of them.

Valaskova et al. (2020) and Sylkin et al. (2018, 2019, 2020) use to diagnose the financial security of the enterprise classical methods of assessing the probability of bankruptcy, but modify and improve them.

A significant group of authors offer to assessing the financial security of the enterprise in the context of factors (potential internal and external threats) that affect the financial security of enterprises (Koleda & Lāce, 2008; Bilomistniy et al., 2017; Mbatha & Ngibe, 2017; Britchenko et al., 2018; Safargaliev, 2019; Nguyen & Nguyen, 2020; Franchuk et al., 2020).

Other author's approaches are usually based on one of the above or combine several of the previous ones, e.g.: empirical model based on the Cobb-Douglas power function used to examine the regressive dependency of profit on sales upon the EU operational fund and the EU fund for the support of the market and capital. The model has also been used to calculate the marginal and average profitability for the aforesaid funds as measures of the efficiency of their financial security with small- and medium-sized enterprises (Zwolak, 2017). And assessment of the level of financial security of enterprises based on the theory of comprehensive assessment; creating a composite index of financial security and determining its level based on the dual use of the Harrington Desirability Scale (Hryhoruk et al., 2019).

It should be noted that all the above methods of assessing the financial security of the enterprise are based on the use of official financial statements of the enterprise and do not provide for any adjustment. And it is this shortcoming that will be taken into account in the methodology proposed for consideration in this article.

Thus, in general, in order to diagnose the level of financial security of an enterprise, it is advisable to use the methodological approaches that will make it possible to identify potential threats and risks in the activity of the enterprise and to quickly find effective ways of counteracting that guarantee a stable financial state and the possibility of further development.

2. Methodology

Given the crucial role of basic information in the process of diagnosing the financial security of an enterprise, it is useful to consider a number of policy questions concerning the methodology for modifying its financial statements. In recent years, Ukraine has undergone fundamental changes in the composition of financial statements which now meet the requirements of international standards. This has significantly changed the information base for diagnosing and managing the financial security of enterprises which has had an impact on their methodology.

Thus, the first step in improving the process of diagnosing the financial security of an enterprise should be to change its information base, namely to modify the financial statements. For this purpose, the methodology of Abryutina (2002) was chosen as a basis, because today it is the only one that provides for the structuring of assets and capital of the enterprise in order to assess the overall level of financial stability of the enterprise. Accordingly, it is proposed to modify the standard structure of economic assets (non-current and current assets) and capital (equity and liabilities) to assess the financial condition of the enterprise as follows (Figure 1).

That is, in addition to the standard division of economic assets by the nature of participation in the economic process (current and non-current) it is proposed to use other classification features of enterprise assets: by the level of liquidity (liquid and non-illiquid assets), by the form of functioning (financial and non-financial assets), by the level of mobility (mobile and non-mobile assets) and their combination (non-mobile financial, liquid non-financial, non-financial illiquid, non-mobile financial and liquid non-financial assets).

Structuring the amount of capital of the enterprise (liabilities from the balance sheet) under the model of modified financial statements, can be represented as follows (Figure 2).

Accordingly, for diagnostic purposes, it is envisaged to group financial capital not only on the basis of equity and liabilities, but to allocate a separate component of equity in revaluations, and to divide liabilities not into long-term and short-term liabilities, but external and internal liabilities.

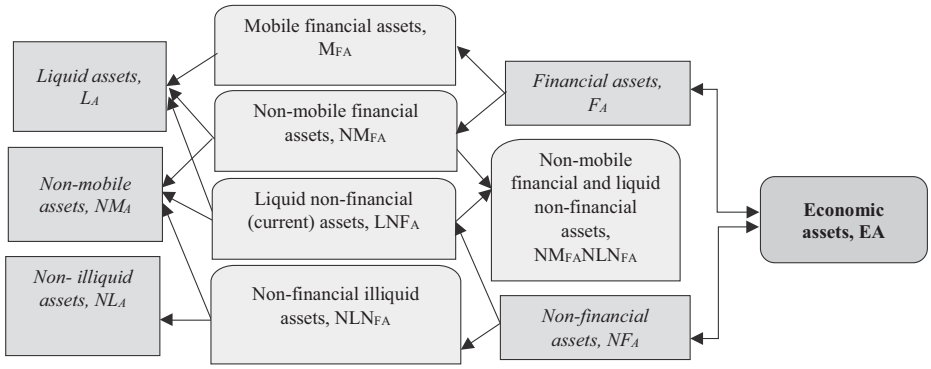

Figure 1. Scheme of economic assets modifications of the enterprise
(source: compiled by the authors on the basis of Abryutina, 2002)

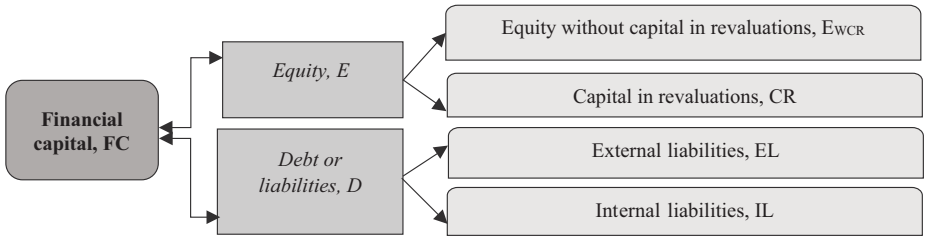

Figure 2. Scheme of financial capital modifications of the enterprise
(source: compiled by the authors on the basis of Abryutina, 2002).

However, this methodology was developed in 2002 for Russian companies and for old forms of financial reporting, which is unsuitable for use in Ukrainian enterprises in modern conditions. That is why it is proposed, first of all, to bring the methodology into line with modern financial reporting standards in Ukraine which are close to international standards. And calculation of the above components economic assets and financial capital should be carried out according to the following formulas (Table 1).

Table 1. Algorithm for calculating the main components of modified financial statements model (source: compiled by the author)

Algorithm for calculating	
Components of economic assets	Components of financial capital
$EA = F_A + NF_A$ or $EA = M_{FA} + NM_A$ or $EA = L_A + NL_A$	$FC = E + D$
$F_A = M_{FA} + NM_{FA}$	$E = E_{WCR} + CR$
$NF_A = LNF_A + NLN_{FA}$	$D = EL + IL$
$L_A = M_{FA} + NM_{FA} + LNF_A$	$EL = BC_{LT} + OL_{LT} + BC_{ST} + AP_C + FPI + CL_O$
$NM_{FA}NLN_{FA} = NM_{FA} + LNF_A$	$IL = LTS + TF + CS + SL$
$NM_A = NM_{FA}NLN_{FA} + NLN_{FA}$	
$NL_A = NLN_{FA} = NC_A - LT_{FI} + NC_{FS}$	
$M_{FA} = C + C_{FI}$	
$NM_{FA} = LT_{FI} + R + FPE + CA_O$	
$LN_{FA} = IN$	
Legend	
NC_A – non-current assets	BC_{LT} – long-term bank credit (loan)
LT_{FI} – long-term financial investment	OL_{LT} – other long-term liabilities
NC_{FS} – non-current assets for sale	BC_{ST} – short-term bank credit (loan)
C – cash	AP_C – current accounts payable
C_{FI} – current financial investments	FPI – future period incomes
LT_{FI} – long-term financial investments	CL_O – other current liabilities
R – receivables	LTS – long-term software
FPE – future period expenses	TF – targeted financing
CA_O – other current assets	CS – current software
IN – inventories	SL – stable liabilities (current accounts payable for calculations with the budget, payroll, insurance)

The modification of the financial statements made in this way allows to provide the enterprise with a modern tool of financial and economic analysis and to form a complete source information for a comprehensive diagnosis of financial security.

Accordingly, in the symbols we have adopted, the balance sheet formula of the modified financial statements model will be as follows:

$$F_A + NF_A = E + EL + IL\,. \tag{1}$$

Assuming, as confirmed by practice, that long-term credit and loans are directed primarily towards the capital acquisition and capital investment (NLN_{FA}), we can convert the original balance formula as follows:

$$NLN_{FA} + F_A = \left[\left(E + D_{LT}\right) - NL_A\right] + \left[BC_{ST} + AP_C + CL_O\right], \tag{2}$$

where D_{LT} – long-term debt (borrowed capital).

With the model thus transformed, the following conclusions can be drawn: if stocks are limited in size [$LNF_A \leq (E+D_{LT}) - NL_A$] the financial soundness of the enterprise will be ensured; and the financial soundness condition will ensure the solvency of the enterprise, i.e., the financial assets will cover current liabilities [$F_A \geq BC_{ST} + AP_C + CL_O$].

The generalization of the financial security system of an enterprise should be considered as the assessment of its position on the scale "financial stability – solvency – risk" based on the use of the modified financial statements model, which involves the calculation of indicators of financial stability (I_{FS}), solvency (I_S), and financial safety or risk (I_R).

Accordingly, an assessment of the financial stability of an enterprise should be begun by determining the adequacy of equity to secure non-financial assets. The excess of equity over this requirement forms the capital that accumulates in financial assets and serves as a tool for managing financial stability. Therefore, a financial equilibrium point can be defined for each enterprise where equity provides non-financial assets and financial assets cover the liabilities of the enterprise. In practice, there is always a deviation in one direction or another and the size of the deviation is the indicator of financial stability (I_{FS}):

$$I_{FS} = E - NF_A = F_A - D\,. \tag{3}$$

The main indicator of an enterprise's solvency is the indicator (I_S), which shows the adequacy, excess or insufficiency of funds in relation to the enterprise's current liabilities:

$$I_S = M_{FA} - D = E - NM_{FA}\,. \tag{4}$$

Accordingly, it is possible to distinguish the following states of solvency of an enterprise: absolute solvency where all obligations can be covered by the mobile assets of the enterprise; guaranteed solvency, if all liabilities are covered by the financial assets of the enterprise; potential solvency provided that not only the financial assets of the enterprise but also the non-financial (liquid) assets of the enterprise are covered; insolvency where the enterprise has a liquidity shortfall to meet the liability.

The safety or risk scale is based on the comparison of an enterprise's equity with non-financial illiquid assets. Safety or risk indicator (I_R) identifies reserves of its own working assets that, when available, create financial and economic security and is determined by the formula:

$$I_R = E - NLN_{FA}. \tag{5}$$

In general, based on the modified financial statements model, it is proposed to diagnose the financial security of an enterprise using three scales: financial stability, solvency, risk, and their relationships (Table 2).

Table 2. Financial security diagnosis matrix of an enterprise based on the modified financial statements model (source: compiled by the authors on the basis of Abryutina, 2002)

Financial stability scale		Solvency scale	Financial risk scale	*Level of financial security*
General	Differentiated			
Financial stability	Perfect stability $NM_A < E < EA$ $NM_{FA} < I_{FS} < F_A$	Absolute solvency $0 < D < M_{FA}$ $NM_A < E < EA$ $0 < I_S < M_{FA}$	Maximum independence $NM_A < E < EA$ $NM_{FA}\, NLN_{FA} < I_R < L_A$	*Absolute*
	Sufficient stability $0 < NF_A < E < NM_A$ $0 < I_{FS} < NMF_A$	Guaranteed solvency $M_{FA} < D < F_A$ $NF_A < E < NM_A$ $-NM_A < I_{FS} < 0$	Optimal reliability $0 < NF_A < E < NM_A$ $LN_{FA} < I_R < NM_{FA}$ NLN_{FA}	*High*
Financial equilibrium	$I_{FS} = 0\ ,\ I_S < 0\ ,\ I_R > 0$			*Normal*
Financial instability	Tension $0 < NLN_{FA} < E < NF_A$ $-LN_{FA} < I_{FS} < 0$	Potential solvency $F_A < D < L_A$ $NLN_{FA} < E < NF_A$ $-NM_{FA}\, NLN_{FA} < I_S < -NM_A$	Relative security $NLN_{FA} < E < NF_A$ $0 < I_R < NLN_{FA}$	*Acceptable*
	Risk area $0 < E < NLN_{FA}$ $-NF_A < I_{FS} < -LN_{FA}$	Insolvency $L_A < D < EA$ $0 < E < NLN_{FA}$ $-NM_A < I_S < -NM_{FA}\, NLN_{FA}$	Crisis risk $0 < E < NLN_{FA}$ $-NLN_{FA} < I_R < 0$	Low

Secondly, in contrast to the method of Abryutina, which proposes to assess on the basis of three scales only the overall level of financial stability of the enterprise, author proposes depending on the location of the enterprise in one of three states: stability, equilibrium, and instability, to define the limits of its security and the risk of operating from absolute to low. That is, an enterprise that has "perfect stability – absolute solvency – maximum independence" will have an absolute level of financial security; the provision "sufficient stability – guaranteed solvency – optimal reliability" will correspond to a high level of financial security; the state of financial equilibrium is the normal level of financial security; the provision "tension – potential solvency – relative security" corresponds to an acceptable level of financial security; and the position "risk area – insolvency – crisis risk" characterizes the low level of financial security.

Thirdly, the author proposes to improve this methodology it in order to increase accuracy, full reliability and comparability of the initial information, namely, to supplement it with a mechanism for adjusting financial statements for inflation.

In our view, the proposed by Abryutina methodology for modifying financial statements apart from certain advantages, has a significant drawback – it does not ensure full reliability and comparability of the initial information in the process of managing the financial security of an enterprise. After all, it is based on the use of values derived from the original valuation. The original cost of the assets is the cost of their acquisition and the amount received on credit for the liabilities. Historical values are expressed in actual prices at the time of the transaction. However, the valuation of many items in the financial statements of an enterprise

and the accounting data, which is the information base, is subject to considerable distortion over time as a result of inflationary processes of any economy and especially of Ukrainian enterprises (Appendix, Table A.1).

Therefore, the next step in improving the method of diagnosing the financial security of an enterprise is to adjust the indicators of modified financial statements. It should be noted that the methodological issues involved in carrying out such adjustment in order to achieve a greater degree of reliability and objectivity have not found the necessary expression in the national scientific and economic literature. The solution to this problem, in our view, requires a more detailed examination of the following main points relating to the definition:

- inflation adjustment methods for modified financial statements;
- methods and indicators for measuring inflation;
- adjustment factors for modified financial statements.

The choice of the method of adjusting the modified financial statements is important as the choice of the adjustment method will determine to a large extent the reliability of the results and the validity of the conclusions reached. First of all, it should be noted that the choice of the *adjustment base*, i.e., the use of data of the reporting period (the inflation method) or past (the deflation method) as a base for comparison will influence the mechanism of calculation of the indicators. In this case, it is recommended to use the actual value of the accounting period – the inflation method.

The justification for determining the *adjustment method* is more complex than the choice of base: according to currency fluctuations or price levels (based on a base or chained price index, valuation in monetary units of equal purchasing power, revaluation in present value and combined method).

An examination of the analytical work of domestic enterprises has shown that the lack of uniform methodological approaches to adjusting financial reporting under conditions of inflation affects the soundness of the definition of their financial security and most enterprises do not make any adjustments at all.

In recent years, the *currency exchange rate adjustment method* has become quite common. Conversions to a more stable currency, such as the United States dollar or the Euro, using a nominal exchange rate, are considered sufficient to ensure the reliability and comparability of financial reporting. We believe that the approach whereby previously modified financial statements can only be presented in a hard currency once they have been adjusted for inflation is more methodical to remove distortions and bring their valuation closer to fair value. This adjustment method, despite its limitations, can be considered as auxiliary and least time-consuming as it can be used in the short-term adjustment period.

The *constant price model* is based on the use of a general price index to periodically recalculate financial statements against changes in the purchasing power of money but does not take into account price movements for individual components of assets or capital. In this method, non-monetary items are adjusted for inflation. The formula for this adjustment when recalculating modified financial statements is as follows:

$$I_i^{av} = I_i^{iv} \times P_i, \tag{6}$$

where I_i^{av} – adjusted value of a certain indicator of modified financial statements of the i-th period;

I_i^{iv} – starting value of the indicator of modified financial statements of the i-th period;
P_i – price index of the reporting period compared to the i-th period.

This formula can be modified depending on whether the adjustment base is chosen: inflation or deflation. Thus, the formula for adjusting the modified financial statements according to the method we have chosen inflation will be:

$$I_i^{av} = I_i^{iv} \times \frac{PI_{\frac{r}{b}}}{PI_{\frac{p}{b}}}, \tag{7}$$

where $PI_{r/b}$ – price index of the reporting period compared to the base period;
$PI_{p/b}$ – past price index versus base.

In general terms for the situation inflation of the constant price approach can be presented through the following changes to the modified financial statements model:

$$F_A + NF_A = E + EL + IL. \tag{8}$$

According to the constant price accounting method adjustments will not be made for items of assets and capital of modified financial statements, i.e.:

$$F_A + NF_A \times (1 + i_r) = E \times (1 + i_r) + EL + IL + (NF_A - E) \times i_r, \tag{9}$$

where i_r – inflation rate, coefficient.

By modifying formula (8), you can get the following:

$$NF_A - E = -(F_A - EL - IL), \tag{10}$$

from here:

$$F_A + NF_A \times (1 + i_r) = E \times (1 + i_r) + EL + IL - (F_A - EL - IL) \times i_r$$

or

$$EA + NF_A \times i_r = E \times (1 + i_r) + EL + IL - (F_A - EL - IL) \times i_r. \tag{11}$$

It is worth noting that the modified financial statements listed under the constant price accounting model, while reflecting changes in the value of non-financial items do not provide a differentiated assessment of their real market value over a period of time. Given this, *the current price accounting model* is more accurate, because it involves recalculating modified financial statements items on the basis of sales prices and establishing current estimates of items on the listed assets and liabilities based on their fair market value for a given period. In this case, it is suggested to use adjustments to the modified financial statements on the basis of price indices calculated for each item of assets or liabilities but their level may differ significantly from the overall price index. The sequence of calculations is exactly the same as described above for the constant price method, i.e., recalculated according to the inflation baseline.

A significant problem with this method is the determination of the present value of the assets. In this way, it is proposed that such costs be charged at the time of implementation and write-off. At the time of implementation, it is recommended that replacement value (i.e., replacement costs) be used and, at the time of write-off, the net realizable value or the net

discounted value of the facility be used. In general, the model for adjusting modified current-price financial statements can be presented as follows:

$$EA + \sum_{i=1}^{n} NF_{Ai} \times ir_i = E + EL + IL + \sum_{i=1}^{n} NF_{Ai} \times ir_i$$

or

$$EA + \sum_{i=1}^{n} NF_{Ai} \times ir_i = E + EL + IL + \sum_{i=1}^{n} NF_{Ai} \times ir_i \ , \quad (12)$$

where NF_{Ai} – the size of the i-th non-financial indicator of the modified financial statements;
ir_i – rate of inflation of the i-th non-financial indicator of the modified financial statements, coefficient;
n – the quantity of non-financial indicators of modified financial statements.

In practice, the development of specific methodological approaches and techniques to implement the methods described above may be different depending on the purpose of the adjustment and the desired outcome, for example: a) long-term non-financial items may not be adjusted; b) only items included in the working capital of an enterprise may be adjusted; c) items that have been generated from debt capital may not be adjusted.

The *combined or mixed method of adjusting* modified financial statements involves the use of a general price index to recalculate the sum of equity and individual price indices to recalculate the value of non-financial items of the asset. Accordingly, the model for adjusting modified financial reporting in combination shall be as follows:

$$\sum_{i=1}^{n}\left[NF_{Ai} \times \left(1 + ir_i\right)\right] + F_A = E \times \left(1 + i_r\right) + D + \sum_{i=1}^{n}\left[NF_{Ai} \times \left(ir_i - i_r\right)\right] - \left(F_A - D\right) \times i_r \ . \quad (13)$$

In comparing the previously reviewed methods for adjusting modified financial statements, it is worth noting that:

1. The constant price method is the least labor-intensive and simpler because the adjustment assumes a single conversion index for all non-financial items. On the one hand, this would reduce the possibility of intentionally distorting the cost estimates of the indicators and would make it easier to verify the correctness of the adjustment procedures used and to ensure the comparability of modified financial statements. On the other hand, the use of one for all inflation indices is an additional distorting factor for the reliability and reliability of the data.
2. The current price method is more objective and feasible for practical application in domestic enterprises as experience has shown that the valuation of different indicators of modified financial statements under inflationary conditions changes differently. But, on the other hand, the objective difficulties in applying this method include its high labor intensity and the complexity of the adjustment verification procedure, although this can be avoided by using automated information systems for calculations.
3. The combined method is the most difficult to use in practice.

Another aspect of the practical implementation of methods for adjusting modified financial statements under conditions of inflation relates to the choice of the *method for measuring inflation* and statistical indicators reflecting the extent of inflationary processes in the

Ukrainian economy. In this connection, it is worth noting that the analysis of the recommendations on the adjustment of financial statements contained in the publications of domestic and foreign authors showed that the absolute majority proposes to use the treatment model in constant prices and the consumer price index as an inflation index for adjustment.

3. Results of research

In recent years, Ukraine ranks first in the world in sunflower production, covering a third of the world market. At the same time, the largest share is occupied by the production of unrefined sunflower oil, 95% of which is exported. According to the State Statistics Service of Ukraine (2020), the production of sunflower oil and its fractions has been growing steadily over the past 5 years; in 2020 alone, the production of unrefined sunflower oil increased by 3.6% compared to 2019, the production of refined sunflower oil increased by 17.7%, and sunflower meal – by 6%.

In 2020, according to the Association "Ukroliaprom" (2021a), Ukraine remained the world leader in the production and export of sunflower oil and meal. During the period from September 2020 to February 2021, the structure of exports of oil and fat products was as follows: 77.7% – sunflower oil, 14.4% – sunflower meal, 2.9% – soybean meal, 2.4% – soybean oil, 1.9% – rapeseed oil, 0.7% – others. In 2020, oil-and-fat products worth $ 7.16 billion were exported (+19% by 2019). The share of exports of oil-and-fat products in total exports of goods from Ukraine is 14.5%; in exports of food products and agricultural products – 32.3%. The main growth in exports of oil-and-fat products was provided by sunflower oil (+12.3% in physical terms and +24.4% in value terms), as well as sunflower meal (+11.4% in physical terms and +16.4% in value expression).

However, such positive trends in the industry as a whole, unfortunately, did not always have a positive impact on the financial performance of individual enterprises, as the analysis of financial statements showed that a significant proportion of them suffered losses from operating activities and/or activities as a whole and also had an unsatisfactory financial condition.

According to the author, one of the most important conditions for the formation of positive results of operating activities of sunflower oil production enterprises and ensuring their sustainable growth while maintaining the desired financial condition is the presence of an effective system of financial security.

In order to validate the methodology proposed above for assessing the financial security of an enterprise on the basis of the modified and adjusted financial statements model, leading enterprises of oil-and-fat industry of Ukraine were selected (Appendix, Table A.2), the reason for the selection of which was as follows:

1. Enterprises were selected and grouped according to their specialization (oil-extraction – production of vegetable oils and oil-and-fat – production of animal fats and vegetable oils), size of activity (medium enterprises), organizational and legal form of operation (joint-stock companies).
2. All selected enterprises are joint-stock companies. This condition was important in view of the accessibility and openness of access to financial statements which are the basis for diagnosing the financial security level of enterprises under investigation over the last 7 years.

3. The aim was to select enterprises that have a long-term presence in the market and meet the needs of a large number of consumers and are important in the production of products of oil-and-fat industry. According to the results of the marketing year 2019–2020 ("Ukroliaprom", 2020), 7 out of 9 selected sunflower oil production enterprises are among the top-12 largest enterprises producing the main types of edible oil. In 2020, according to the Association "Ukroliaprom" (2021b), the largest producers of unrefined sunflower oil included: PJSC "ADM Illichivsk" (6 position, share 4.2%), PrJSC "Vinnitsa OSCF" (7 position, share 4.1%), PJSC with foreign investment "Dnipropetrovsk OEP" (9 position, share 3.7%), PJSC "Kropyvnytskyi OEP" (11 position, share 3.4%) and PJSC "Pology OEP" (15 position, share 2.7%). The largest producers of refined sunflower oil included: PJSC with foreign investment "Dnipropetrovsk OEP" (2 position, share 16.2%) and PJSC "Pology OEP" (12 position, share 2.2%). And the largest producers of rapeseed oil in 2020 included PrJSC "Vinnitsa OSCF" (3 position, share 16.9%) and PrJSC "Chernivtsi OSCF" (6 position, share 2.1%).
4. Selected sunflower oil production enterprises are located in different regions of Ukraine.
5. Five of sunflower oil production enterprises (PJSC "ADM Illichivsk", PJSC "Nizhynsky Zhyrcombinat" , PJSC "Pology OEP", PJSC "Zaporizhzhya OEP", PJSC "Zaporizhzhya OFF") operate as independent entities and four are affiliated to associations or large agribusiness holdings (PrJSC "Vinnitsa OSCF" and PrJSC "Chernivtsi OSCF" – are the part of "ViOil Industrial Group"; PJSC with foreign investment "Dnipropetrovsk OEP" – is the part of "Bunge Limited" – Bunge Ukraine; PJSC "Kropyvnytskyi OEP" – is the part of "Kernel Holding S.A.").

Thus, first of all, based on the methodology described above for the development of the modified financial statements model and its adjustment, each of the enterprises studied, it was developed a modified structure of economic assets and financial capital (Appendix, Tables A.3 – A.11).

The next step is calculation the indicators of financial stability (I_{FS}), solvency (I_S), and financial safety or risk (I_R), which will allow to establish whether the enterprises are in a condition financial equilibrium (Table 3).

Financial equilibrium of enterprises is secured if the following conditions are met at the same time: $\begin{cases} IFS=0 \\ IS<0 \\ IR>0 \end{cases}$, but in none of the periods and in any of the investigated enterprises they were performed. Accordingly, the enterprises were or in a position of a financial stability (that is, they had an absolute or high level of financial security), or in a position of financial instability (that is, they had an acceptable or low level of financial security).

The next step is to assess the level of financial security of the surveyed enterprises on the basis of the diagnostic matrix presented above (Table 2). That is, the comparison of the relevant components of economic assets and financial capital will determine the position of each company on the scale "financial stability – solvency – financial risk" in certain periods of time, and their relationship – to establish the level of financial security.

Table 3. Indicators of financial stability, solvency and financial risk sunflower oil production enterprises of Ukraine, thousand UAH (source: authors' calculations)

Evaluation periods	Indicator of:		
	Financial stability (I_{FS})	Solvency (I_S)	Financial risk (I_R)
PJSC "ADM Illichivsk"			
31.12.2013	–9658.0	–42567.0	–3411.0
31.12.2014	–8393.0	–32496.0	2723.0
31.12.2015	–111059.0	–350628.0	–18323.0
31.12.2016	–513197.0	–585801.0	–486476.0
31.12.2017	–554368.0	–607355.0	–516220.0
31.12.2018	–516386.0	–587175.0	–470686.0
31.12.2019	–437569.0	–492267.0	–393211.0
PrJSC "Chernivtsi OSCF"			
31.12.2013	–63908.0	–95925.0	–59962.0
31.12.2014	–81333.0	–120527.0	–68447.0
31.12.2015	–66763.0	–111817.0	–52528.0
31.12.2016	–35803.0	–151025.0	–27873.0
31.12.2017	–92764.0	–150510.0	–41876.0
31.12.2018	–67951.0	–119356.0	–57140.0
31.12.2019	–113901.0	–124598.0	–90650.0
PJSC with foreign investment "Dnipropetrovsk OEP"			
31.12.2013	175950.0	–45026.0	195519.0
31.12.2014	268506.0	–73450.0	295373.0
31.12.2015	316500.0	–80396.0	357709.0
31.12.2016	375064.0	–106494.0	429496.0
31.12.2017	452596.0	–44511.0	525422.0
31.12.2018	447195.0	–131526.0	558758.0
31.12.2019	x	x	x
PJSC "Kropyvnytskyi OEP"			
31.12.2013	32455.0	–26072.0	36831.0
31.12.2014	40489.0	–56344.0	47091.0
31.12.2015	119857.0	–79230.0	126236.0
31.12.2016	90123.0	–95203.0	95995.0
31.12.2017	57107.0	–102388.0	66204.0
31.12.2018	–80957.0	–183674.0	–69116.0
31.12.2019	–148300.0	–218589.0	–136241.0
PJSC "Nizhynsky Zhyrcombinat"			
31.12.2013	–22757.0	–34775.0	–17729.0
31.12.2014	–29146.0	–46549.0	–21230.0
31.12.2015	–41659.0	–57130.0	–35516.0

End of Table 3

Evaluation periods	Indicator of:		
	Financial stability (I_{FS})	Solvency (I_S)	Financial risk (I_R)
31.12.2016	–81993.0	–114314.0	–66406.0
31.12.2017	–147349.0	–226610.0	–117710.0
31.12.2018	–246872.0	–284863.0	–239909.0
31.12.2019	–318662.0	–376099.0	–270902.0
PJSC "Pology OEP"			
31.12.2013	–346078.0	–546369.0	17270.0
31.12.2014	–378352.0	–614075.0	11425.0
31.12.2015	–413168.0	–669272.0	131889.0
31.12.2016	–831290.0	–1174928.0	102284.0
31.12.2017	–876746.0	–1358578.0	113118.0
31.12.2018	–576025.0	–965328.0	51173.0
31.12.2019	–628550.0	–994101.0	–75698.0
PrJSC "Vinnitsa OSCF"			
31.12.2013	–581842.0	–632504.0	–558035.0
31.12.2014	–753074.0	–943736.0	–708361.0
31.12.2015	–1585805.0	–1864677.0	–1015474.0
31.12.2016	–1438859.0	–2287086.0	–1121714.0
31.12.2017	–1627311.0	–2171496.0	–1108891.0
31.12.2018	–1264673.0	–1692447.0	–1105383.0
31.12.2019	–1269443.0	–1471683.0	–1071093.0
PJSC "Zaporizhzhya OEP"			
31.12.2013	x	x	x
31.12.2014	x	x	x
31.12.2015	0.0	0.0	35418.0
31.12.2016	49335.0	–29661.0	49827.0
31.12.2017	74620.0	–2750.0	79434.0
31.12.2018	96239.0	–997.0	101332.0
31.12.2019	63130.0	–34968.0	68474.0
PJSC "Zaporizhzhya OFF"			
31.12.2013	–365605.0	–557315.0	–327730.0
31.12.2014	–532359.0	–749369.0	–415562.0
31.12.2015	–369981.0	–688161.0	–313421.0
31.12.2016	–368404.0	–687097.0	–358962.0
31.12.2017	–417976.0	–722764.0	–414389.0
31.12.2018	–423650.0	–728617.0	–395528.0
31.12.2019	–432650.5	–875161.2	–430687.3

Thus, the results of the financial security diagnosis of sunflower oil production enterprises for the past 7 years shown in Table 4.

Table 4. Financial security diagnosis matrix of a sunflower oil production enterprises based on the modified financial statements model (source: authors' calculations)

Evaluation periods	Indicator of:			*Level of financial security*
	Financial stability (I_{FS})	Solvency (I_S)	Financial risk (I_R)	
PJSC "ADM Illichivsk"				
31.12.2013	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
31.12.2014	$\begin{cases}0 < NLN_{FA} < E < NF_A \\ -LN_{FA} < I_{FS} < 0\end{cases}$ Tension	$\begin{cases}F_A < D < L_A \\ -NM_{FA}NLN_{FA} < I_S < -NM_A\end{cases}$ Potential solvency	$\begin{cases}NLN_{FA} < E < NF_A \\ 0 < I_R < NLN_{FA}\end{cases}$ Relative security	*Acceptable level*
31.12.2015 31.12.2016 31.12.2017 31.12.2018 31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PrJSC "Chernivtsi OSCF"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017 31.12.2018 31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PJSC with foreign investment "Dnipropetrovsk OEP"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017 31.12.2018	$\begin{cases}0 < NF_A < E < NM_A \\ 0 < I_{FS} < NM_{FA}\end{cases}$ Sufficient stability	$\begin{cases}M_{FA} < D < F_A \\ -NM_A < I_S < 0\end{cases}$ Guaranteed solvency	$\begin{cases}0 < NF_A < E < NM_A \\ LN_{FA} < I_R < \\ NM_{FA}NLN_{FA}\end{cases}$ Optimal reliability	*High level*
31.12.2019	x	x	x	
PJSC "Kropyvnytskyi OEP"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017	$\begin{cases}0 < NF_A < E < NM_A \\ 0 < I_{FS} < NM_{FA}\end{cases}$ Sufficient stability	$\begin{cases}M_{FA} < D < F_A \\ -NM_A < I_S < 0\end{cases}$ Guaranteed solvency	$\begin{cases}0 < NF_A < E < NM_A \\ LN_{FA} < I_R < \\ NM_{FA}NLN_{FA}\end{cases}$ Optimal reliability	*High level*

Continue of Table 4

Evaluation periods	Indicator of:			*Level of financial security*
	Financial stability (I_{FS})	Solvency (I_S)	Financial risk (I_R)	
31.12.2018 31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PJSC "Nizhynsky Zhyrcombinat"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017 31.12.2018 31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PJSC "Pology OEP"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017 31.12.2018	$\begin{cases}0 < NLN_{FA} < E < NF_A \\ -LN_{FA} < I_{FS} < 0\end{cases}$ Tension	$\begin{cases}F_A < D < L_A \\ -NM_{FA}NLN_{FA} < I_S < -NM_A\end{cases}$ Potential solvency	$\begin{cases}NLN_{FA} < E < NF_A \\ 0 < I_R < NLN_{FA}\end{cases}$ Relative security	*Acceptable level*
31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PrJSC "Vinnitsa OSCF"				
31.12.2013 31.12.2014 31.12.2015 31.12.2016 31.12.2017 31.12.2018 31.12.2019	$\begin{cases}0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA}\end{cases}$ Risk area	$\begin{cases}L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA}\end{cases}$ Insolvency	$\begin{cases}0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0\end{cases}$ Crisis risk	*Low level*
PJSC "Zaporizhzhya OEP"				
31.12.2013	x	x	x	*x*
31.12.2014	x	x	x	*x*
31.12.2015 31.12.2016 31.12.2017 31.12.2018 31.12.2019	$\begin{cases}0 < NF_A < E < NM_A \\ 0 < I_{FS} < NM_{FA}\end{cases}$ Sufficient stability	$\begin{cases}M_{FA} < D < F_A \\ -NM_A < I_S < 0\end{cases}$ Guaranteed solvency	$\begin{cases}0 < NF_A < E < NM_A \\ LN_{FA} < I_R < \\ NM_{FA}NLN_{FA}\end{cases}$ Optimal reliability	*High level*

End of Table 4

Evaluation periods	Indicator of:			*Level of financial security*
	Financial stability (I_{FS})	Solvency (I_S)	Financial risk (I_R)	
PJSC "Zaporizhzhya OFF"				
31.12.2013	$\begin{cases} 0 < E < NLN_{FA} \\ -NF_A < I_{FS} < -LN_{FA} \end{cases}$ Risk area	$\begin{cases} L_A < D < EA \\ -NM_A < I_S < -NM_{FA}NLN_{FA} \end{cases}$ Insolvency	$\begin{cases} 0 < E < NLN_{FA} \\ -NLN_{FA} < I_R < 0 \end{cases}$ Crisis risk	*Low level*
31.12.2014				
31.12.2015				
31.12.2016				
31.12.2017				
31.12.2018				
31.12.2019				

Note: x – no information to calculate the data.

The obtained results confirm the existence of a direct correlation between changes in the level of financial stability of a group of selected enterprises and the level of their financial security. The analysis of the situation for 2013–2019 allowed clustering of enterprises, conditionally dividing them into several groups.

More than half of the surveyed sunflower oil production enterprises had low level of financial security, which characterized as risk area, insolvency and crisis risk. It was observed in PJSC "ADM Illichivsk" (in all years except 2014), PrJSC "Chernivtsi OSCF", PJSC "Nizhynsky Zhyrcombinat", PrJSC "Vinnitsa OSCF" and PJSC "Zaporizhzhya OFF" for the whole period of the 2013–2019 study.

High level of financial security, that is sufficient stability, guaranteed solvency and optimal reliability, during 2013–2019 had two of sunflower oil production enterprises: PJSC with foreign investment "Dnipropetrovsk OEP" and PJSC "Zaporizhzhya OEP". The enterprises of this conditional group ensured the stability of financial security at a high level, which is a guarantee of further safe financing of current activities and the continuity of their production cycle.

PJSC "Kropyvnytskyi OEP" had high level of financial security in the period of 2013–2017, but in 2018 and 2019 has already entered a risk zone with a low level of financial security, indicating the high risk of its activities in recent years.

The situation was similar at PJSC "Pology OEP", because it has acceptable level of financial security, that is tension, potential solvency and relative security from 2013 to 2018, and in 2019 the enterprise found itself in the zone of risk and insolvency.

In general, the results of testing the proposed model of diagnostics of financial security of the enterprise, according to the author, are a reflection of the effectiveness of management of all operating activities sunflower oil production enterprises, as well as informative tools for factor analysis in managing their financial security in terms of three key factors: financial stability, solvency and financial risk.

Conclusions

Thus, as the results of the research showed, the use of the model of modified and adjusted financial statements proposed by the author is a convenient and effective tool for diagnosing the financial security level of an enterprise in terms of the main components: financial stability, solvency and risk, ensuring the efficiency of the financial security management process of an enterprise in both the current and the prospective periods.

Approbation of the proposed model involved the development of modified financial statements for the studied 9 sunflower oil production enterprises, its adjustment based on the model of accounting at constant prices and using the consumer price index as a method of measuring inflation, calculation the indicators of financial stability, solvency and financial risk and diagnosis of financial security level of 9 sunflower oil production enterprises.

The research identified a direct dependence of the level of financial security of enterprises on key financial indicators: financial stability, solvency and financial risk.

The diagnostic results showed that 5 out of 9 surveyed enterprises PrJSC "Chernivtsi OSCF", PJSC "Nizhynsky Zhyrcombinat", PrJSC "Vinnitsa OSCF", PJSC "Zaporizhzhya OFF" and PJSC "ADM Illichivsk" constantly had a low level of financial security; acceptable level of financial security was at PJSC "Pology OEP" from 2013 to 2018, and in 2019 the enterprise found itself in the zone of risk and insolvency; and high level of financial security during 2013–2019 had two of sunflower oil production enterprises: PJSC with foreign investment "Dnipropetrovsk OEP" and PJSC "Zaporizhzhya OEP"; PJSC "Kropyvnytskyi OEP" had high level of financial security in the period of 2013–2017, but in 2018 and 2019 has already entered a risk zone with a low level of financial security.

That is, most enterprises in the oki-and-fat industry require constant and effective management of financial security in order to improve its level, and the methodological approach proposed in the article can become not only an important tool for diagnosing the level of their financial security, but also its forecasting.

In our view, the *advantages* of this model are: first, it enables a deeper, more comprehensive diagnosis of the financial security of an enterprise; second, it not only assesses one component of financial security but links several components – financial stability, solvency and financial risk, thus, it is possible to predict the level of financial security of an enterprise; thirdly, there is no need to impose certain regulatory restrictions on enterprises in different sectors of the economy, specialization, forms of ownership, organizational and legal forms and the extent of their activities; fourth, as the coefficient model it allows you to develop a matrix of the strategic financial position of an enterprise's domestic financial environment as well as a matrix of possible strategic directions for their financial development, identifying the desired financial strategy within the framework of the desired level of financial security; fifth, the method of adjustment for inflationary processes could be used as a stand-alone instrument for standard (not modified) forms of financial reporting of an enterprise used to diagnose the financial security of an enterprise through other methodological approaches.

As for the *shortcomings*, it is worth noting that since the model is based on the use of financial statements (although modified and adjusted) it has some of the same weaknesses as an enterprise's financial statements (and all known methodologies for evaluating the financial security today): the diagnostics is instantaneous and refers to the past period; financial

statements against which the financial security of an enterprise is assessed reflects only those events that can be presented in monetary terms and have already occurred; most indicators do not take into account certain potential liabilities because they are not reflected in the balance sheet which is the main source of information for their determination; the inability to take account of the sectoral characteristics of enterprises; some limitations in the financial security diagnostics that can be derived from this model due to the limited information available in the financial statements.

Thus, the alternative approach considered in the article to diagnose the level of financial security by modifying the financial statements, as well as the application of the proposed methods and coefficients of its adjustment, enables enterprises in any economic activity or branch of the economy (except companies from financial sector) to diagnose their financial security quickly and conveniently; to manage it effectively during the current period and could also become a tool for the strategic direction of financial development and forecasting the level of financial security in the future.

Future research is planned to focus on substantiation the methodical approaches to the multi-level assessment of the financial security sunflower oil production enterprises, development of a system for assessing the financial security of operating activities sunflower oil production enterprises; assessment of the impact of operational financing policy and financial security of operational activities on the general state of financial security sunflower oil production enterprises.

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Appendix

Table A.1. Consumer price index, in % to the previous year (source: compiled by the author on the basis of State Statistics Service of Ukraine, 2020)

Year	2013	2014	2015	2016	2017	2018	2019	2020
CPI	0.5	24.9	43.3	12.4	13.7	9.8	4.1	5.0

Table A.2. The main sunflower oil production enterprises of Ukraine (source: compiled by the author) *

Company	Official website / Homepage	Trade marks / Brands
PJSC "Zaporizhzhya Oil-Extraction Plant" ("Zaporizhzhya OEP")	https://zmez.com.ua	
PJSC "Zaporizhzhya oil and fat factory" (Zaporizhzhya OFF)	http://zmgk.com.ua	"Shchedro"
PJSC "Nizhynsky Zhyrcombinat"	http:/ngk.net.ua	"Nizhynska oliya"
PJSC "Pology Oil-Extraction Plant" (Pology OEP)	https://mezpology.zp.ua	"Slaviya", "Smachna kraplya", Private Label
PJSC "ADM Illichivsk"	https://adm.com	
Private Company "Oliyar"	https://oliyar.com.ua	"Majola", "Sonyashna", "Rodynna" and "Oliyar".
LLC "UkrOliya"	https://www.ukroliya.com	"EFFO", "Garna Organica", "Dikanka"
LLC "Swativska Oil", "Agrex"	http://www.agrex.com.ua	"Swativska oliya"
LLC "Delta Wilmar Ukraine"	https://www.deltawilmar.com	
LLC "JS Cargill"	https://www.cargill.com/worldwide/ukraine-uk	
"ViOil Industrial Group"		
PrJSC "Vinnitsa Oil Seeds Crushing Factory" (Vinnitsa OSCF)	http://vmzhk.vioil.com	
PrJSC "Chernivtsi Oil Seeds Crushing Factory" (OSCF) Chernivtsi	http://chmzhk.vioil.com	
"Bunge Limited"		
LLC "Mykolaiv Oil Extraction Plant"	Bunge Ukraine: www.bunge.com https://oleina.ua	"Oleyna", "Rozumnytsya"
PJSC with foreign investment "Dnipropetrovsk Oil Extraction Plant" (Dnipropetrovsk OEP)		
"Kernel Holding S.A."		
PJSC "Kropyvnytskyi OEP"	http://kirovogradoliya.pat.ua	
LLC "Poltava Oil Crushing Plant"	https://sdar.com.ua	"Shchedryi Dar"
LLC "Prydniprovsk Oil Crushing Plant"	https://www.kernel.ua	"STOZHAR", "CHUMAK Sunflower Oil"
LLC "Ukrainian Black Sea Industry"		
LLC "Starokostiantyniv Oil Crushing Plant"		
LLC "Bandurka Oil Crushing Plant"		
LLC "Vovchansk Oil Crushing Plant"		
LLC "Prykolotne Oil Crushing Plant"		

Note: * Enterprises highlighted in italics are used as objects of analysis.

Table A.3. Modified structure of economic assets and financial capital PJSC "ADM Illichivsk", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	33 072.0	24 346.0	251 355.0	75 605.0	53 157.0	71 322.0	55 143.0
1.1. Mobile financial assets	163.0	243.0	11 786.0	3 001.0	170.0	533.0	445.0
1.2. Non-mobile financial assets	32 909.0	24 103.0	239 569.0	72 604.0	52 987.0	70 789.0	54 698.0
2. Non-financial assets	110 484.0	116 602.0	227 524.0	579 896.0	613 104.0	593 610.0	590 103.0
2.1. Liquid non-financial assets	6 247.0	11 116.0	92 736.0	26 721.0	38 148.0	45 700.0	44 358.0
2.2. Non-financial illiquid assets	104 237.0	105 486.0	134 788.0	553 175.0	574 956.0	547 910.0	545 745.0
3. Non-mobile financial and liquid non-financial assets	39 156.0	35 219.0	332 305.0	99 325.0	91 135.0	116 489.0	99 056.0
4. Mobile financial assets	163.0	243.0	11 786.0	3 001.0	170.0	533.0	445.0
5. Non-mobile assets	143 393.0	140 705.0	467 093.0	652 500.0	666 091.0	664 399.0	644 801.0
6. Liquid assets	39 319.0	35 462.0	344 091.0	102 326.0	91 305.0	117 022.0	99 501.0
7. Non- illiquid assets	104 237.0	105 486.0	134 788.0	553 175.0	574 956.0	547 910.0	545 745.0
Modified structure of financial capital							
1. Equity	100 826.0	108 209.0	116 465.0	66 699.0	58 736.0	77 224.0	152 534.0
1.1. Equity without capital in revaluations	100 826.0	108 209.0	116 465.0	66 699.0	58 736.0	77 224.0	152 534.0
1.2. Capital in revaluations	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Debt	42 730.0	32 739.0	362 414.0	588 802.0	607 525.0	587 708.0	492 712.0
2.1. External liabilities	39 464.0	23 111.0	356 136.0	574 098.0	600 135.0	552 614.0	484 717.0
2.2. Internal liabilities	3 266.0	9 628.0	6 278.0	14 704.0	7 390.0	35 094.0	7 995.0

Table A.4. Modified structure of economic assets and financial capital PrJSC "Chernivtsi OSCF", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	32 236.0	39 205.0	45 258.0	115 452.0	57 887.0	51 574.0	11 444.0
1.1. Mobile financial assets	219.0	11.0	204.0	230.0	141.0	169.0	747.0
1.2. Non-mobile financial assets	32 017.0	39 194.0	45 054.0	115 222.0	57 746.0	51 405.0	10 697.0
2. Non-financial assets	251 469.0	377 500.0	683 389.0	750 665.0	769 894.0	686 665.0	679 700.0
2.1. Liquid non-financial assets	3 946.0	12 886.0	14 235.0	7 930.0	50 888.0	10 811.0	23 251.0
2.2. Non-financial illiquid assets	247 523.0	364 614.0	669 154.0	742 735.0	719 006.0	675 854.0	656 449.0
3. Non-mobile financial and liquid non-financial assets	35 963.0	52 080.0	59 289.0	123 152.0	108 634.0	62 216.0	33 948.0
4. Mobile financial assets	219.0	11.0	204.0	230.0	141.0	169.0	747.0
5. Non-mobile assets	283 486.0	416 694.0	728 443.0	865 887.0	827 640.0	738 070.0	690 397.0
6. Liquid assets	36 182.0	52 091.0	59 493.0	123 382.0	108 775.0	62 385.0	34 695.0
7. Non- illiquid assets	247 523.0	364 614.0	669 154.0	742 735.0	719 006.0	675 854.0	656 449.0
Modified structure of financial capital							
1. Equity	187 561.0	296 167.0	616 626.0	714 862.0	677 130.0	618 714.0	565 799.0
1.1. Equity without capital in revaluations	187 561.0	191 045.0	194 198.0	194 828.0	157 164.0	99 783.0	48 590.0
1.2. Capital in revaluations	0.0	105 122.0	422 428.0	520 034.0	519 966.0	518 931.0	517 209.0
2. Debt	96 144.0	120 538.0	112 021.0	151 255.0	150 651.0	119 525.0	125 345.0
2.1. External liabilities	94 330.0	118 448.0	109 409.0	148 183.0	146 814.0	115 750.0	120 883.0
2.2. Internal liabilities	1 814.0	2 090.0	2 612.0	3 072.0	3 837.0	3 775.0	4 462.0

Table A.5. Modified structure of economic assets and financial capital PJSC with foreign investment "Dnipropetrovsk OEP", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	221 015.0	342 576.0	396 950.0	482 816.0	503 342.0	580 781.0	x
1.1. Mobile financial assets	39.0	620.0	54.0	1 258.0	6 235.0	2 060.0	x
1.2. Non-mobile financial assets	220 976.0	341 956.0	396 896.0	481 558.0	497 107.0	578 721.0	x
2. Non-financial assets	213 819.0	225 608.0	215 201.0	201 598.0	158 903.0	161 557.0	x
2.1. Liquid non-financial assets	19 569.0	26 867.0	41 209.0	54 432.0	72 826.0	111 563.0	x
2.2. Non-financial illiquid assets	194 250.0	198 741.0	173 992.0	147 166.0	86 077.0	49 994.0	x
3. Non-mobile financial and liquid non-financial assets	240 545.0	368 823.0	438 105.0	535 990.0	569 933.0	690 284.0	x
4. Mobile financial assets	39.0	620.0	54.0	1 258.0	6 235.0	2 060.0	x
5. Non-mobile assets	434 795.0	567 564.0	612 097.0	683 156.0	656 010.0	740 278.0	x
6. Liquid assets	240 584.0	369 443.0	438 159.0	537 248.0	576 168.0	692 344.0	x
7. Non- illiquid assets	194 250.0	198 741.0	173 992.0	147 166.0	86 077.0	49 994.0	x
Modified structure of financial capital							
1. Equity	389 769.0	494 114.0	531 701.0	576 662.0	611 499.0	608 752.0	x
1.1. Equity without capital in revaluations	388 791.0	493 136.0	530 723.0	575 684.0	610 521.0	608 752.0	x
1.2. Capital in revaluations	978.0	978.0	978.0	978.0	978.0	0.0	x
2. Debt	45 065.0	74 070.0	80 450.0	107 752.0	50 746.0	133 586.0	x
2.1. External liabilities	32 505.0	59 362.0	33 105.0	26 398.0	27 976.0	100 464.0	x
2.2. Internal liabilities	12 560.0	14 708.0	47 345.0	81 354.0	22 770.0	33 122.0	x

Table A.6. Modified structure of economic assets and financial capital PJSC "Kropyvnytskyi OEP", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	61 923.0	97 029.0	200 204.0	186 036.0	159 558.0	102 773.0	70 306.0
1.1. Mobile financial assets	3 396.0	196.0	1 117.0	710.0	63.0	56.0	17.0
1.2. Non-mobile financial assets	58 527.0	96 833.0	199 087.0	185 326.0	159 495.0	102 717.0	70 289.0
2. Non-financial assets	247 009.0	231 287.0	166 685.0	224 629.0	283 969.0	411 870.0	487 795.0
2.1. Liquid non-financial assets	4 376.0	6 602.0	6 379.0	5 872.0	9 097.0	11 841.0	12 059.0
2.2. Non-financial illiquid assets	242 633.0	224 685.0	160 306.0	218 757.0	274 872.0	400 029.0	475 736.0
3. Non-mobile financial and liquid non-financial assets	62 903.0	103 435.0	205 466.0	191 198.0	168 592.0	114 558.0	82 348.0
4. Mobile financial assets	3 396.0	196.0	1 117.0	710.0	63.0	56.0	17.0
5. Non-mobile assets	305 536.0	328 120.0	365 772.0	409 955.0	443 464.0	514 587.0	558 084.0
6. Liquid assets	66 299.0	103 631.0	206 583.0	191 908.0	168 655.0	114 614.0	82 365.0
7. Non- illiquid assets	242 633.0	224 685.0	160 306.0	218 757.0	274 872.0	400 029.0	475 736.0
Modified structure of financial capital							
1. Equity	279 464.0	271 776.0	286 542.0	314 752.0	341 076.0	330 913.0	339 495.0
1.1. Equity without capital in revaluations	114 514.0	107 380.0	122 146.0	163 044.0	189 368.0	179 315.0	188 131.0
1.2. Capital in revaluations	164 950.0	164 396.0	164 396.0	151 708.0	151 708.0	151 598.0	151 364.0
2. Debt	29 468.0	56 540.0	80 347.0	95 913.0	102 451.0	183 730.0	218 606.0
2.1. External liabilities	27 811.0	53 106.0	77 701.0	93 146.0	98 842.0	127 961.0	139 177.0
2.2. Internal liabilities	1 657.0	3 434.0	2 646.0	2 767.0	3 609.0	55 769.0	79 429.0

Table A.7. Modified structure of economic assets and financial capital PJSC "Nizhynsky Zhyrcombinat", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	12 691.0	17 974.0	19 248.0	32 322.0	79 930.0	39 102.0	71 791.0
1.1. Mobile financial assets	673.0	571.0	3 777.0	1.0	669.0	1 111.0	14 354.0
1.2. Non-mobile financial assets	12 018.0	17 403.0	15 471.0	32 321.0	79 261.0	37 991.0	57 437.0
2. Non-financial assets	36 267.0	42 781.0	45 140.0	77 408.0	148 259.0	187 289.0	222 314.0
2.1. Liquid non-financial assets	5 028.0	7 916.0	6 143.0	15 587.0	29 639.0	6 963.0	47 760.0
2.2. Non-financial illiquid assets	31 239.0	34 865.0	38 997.0	61 821.0	118 620.0	180 326.0	174 554.0
3. Non-mobile financial and liquid non-financial assets	17 046.0	25 319.0	21 614.0	47 908.0	108 900.0	44 954.0	105 197.0
4. Mobile financial assets	673.0	571.0	3 777.0	1.0	669.0	1 111.0	14 354.0
5. Non-mobile assets	48 285.0	60 184.0	60 611.0	109 729.0	227 520.0	225 280.0	279 751.0
6. Liquid assets	17 719.0	25 890.0	25 391.0	47 909.0	109 569.0	46 065.0	119 551.0
7. Non- illiquid assets	31 239.0	34 865.0	38 997.0	61 821.0	118 620.0	180 326.0	174 554.0
Modified structure of financial capital							
1. Equity	13 510.0	13 635.0	3 481.0	–4 585.0	910.0	-59 583.0	–96 348.0
1.1. Equity without capital in revaluations	13 510.0	13 635.0	3 481.0	–4 585.0	910.0	-59 583.0	–96 348.0
1.2. Capital in revaluations	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Debt	35 448.0	47 120.0	60 907.0	114 315.0	227 279.0	285 974.0	390 453.0
2.1. External liabilities	34 249.0	46 336.0	60 194.0	111 358.0	214 031.0	283 522.0	350 882.0
2.2. Internal liabilities	1 199.0	784.0	713.0	2 957.0	13 248.0	2 452.0	39 571.0

Table A.8. Modified structure of economic assets and financial capital PJSC "Pology OEP", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	239 801.0	278 510.0	300 591.0	436 386.0	523 940.0	422 579.0	450 543.0
1.1. Mobile financial assets	39 510.0	42 787.0	44 487.0	92 748.0	42 108.0	33 276.0	84 992.0
1.2. Non-mobile financial assets	200 291.0	235 723.0	256 104.0	343 638.0	481 832.0	389 303.0	365 551.0
2. Non-financial assets	633 778.0	652 986.0	820 170.0	1 221 408.0	1 284 012.0	1 567 284.0	1 626 029.0
2.1. Liquid non-financial assets	363 348.0	389 777.0	545 057.0	933 574.0	989 864.0	627 198.0	552 852.0
2.2. Non-financial illiquid assets	270 430.0	263 209.0	275 113.0	287 834.0	294 148.0	940 086.0	1 073 177.0
3. Non-mobile financial and liquid non-financial assets	563 639.0	625 500.0	801 161.0	1 277 212.0	1 471 696.0	1 016 501.0	918 403.0
4. Mobile financial assets	39 510.0	42 787.0	44 487.0	92 748.0	42 108.0	33 276.0	84 992.0
5. Non-mobile assets	834 069.0	888 709.0	1 076 274.0	1 565 046.0	1 765 844.0	1 956 587.0	1 991 580.0
6. Liquid assets	603 149.0	668 287.0	845 648.0	1 369 960.0	1 513 804.0	1 049 777.0	1 003 395.0
7. Non- illiquid assets	270 430.0	263 209.0	275 113.0	287 834.0	294 148.0	940 086.0	1 073 177.0
Modified structure of financial capital							
1. Equity	287 700.0	274 634.0	407 002.0	390 118.0	407 266.0	991 259.0	997 479.0
1.1. Equity without capital in revaluations	211 819.0	198 753.0	334 845.0	325 409.0	346 279.0	283 385.0	324 175.0
1.2. Capital in revaluations	75 881.0	75 881.0	72 157.0	64 709.0	60 987.0	707 874.0	673 304.0
2. Debt	585 879.0	656 862.0	713 759.0	1 267 676.0	1 400 686.0	998 604.0	1 079 093.0
2.1. External liabilities	557 015.0	243 475.0	477 421.0	655 329.0	688 348.0	456 838.0	568 623.0
2.2. Internal liabilities	28 864.0	413 387.0	236 338.0	612 347.0	712 338.0	541 766.0	510 470.0

Table A.9. Modified structure of economic assets and financial capital PrJSC "Vinnitsa OSCF", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	50 764.0	190 699.0	289 912.0	905 829.0	567 599.0	477 879.0	245 633.0
1.1. Mobile financial assets	102.0	37.0	11 040.0	57 602.0	23 414.0	50 105.0	43 393.0
1.2. Non-mobile financial assets	50 662.0	190 662.0	278 872.0	848 227.0	544 185.0	427 774.0	202 240.0
2. Non-financial assets	1 006 785.0	1 764 302.0	3 890 294.0	4 251 854.0	4 355 844.0	3 895 246.0	3 820 023.0
2.1. Liquid non-financial assets	23 807.0	44 713.0	570 331.0	317 145.0	518 420.0	159 290.0	198 350.0
2.2. Non-financial illiquid assets	982 978.0	1 719 589.0	3 319 963.0	3 934 709.0	3 837 424.0	3 735 956.0	3 621 673.0
3. Non-mobile financial and liquid non-financial assets	74 469.0	235 375.0	849 203.0	1 165 372.0	1 062 605.0	587 064.0	400 590.0
4. Mobile financial assets	102.0	37.0	11 040.0	57 602.0	23 414.0	50 105.0	43 393.0
5. Non-mobile assets	1 057 447.0	1 954 964.0	4 169 166.0	5 100 081.0	4 900 029.0	4 323 020.0	4 022 263.0
6. Liquid assets	74 571.0	235 412.0	860 243.0	1 222 974.0	1 086 019.0	637 169.0	443 983.0
7. Non- illiquid assets	982 978.0	1 719 589.0	3 319 963.0	3 934 709.0	3 837 424.0	3 735 956.0	3 621 673.0
Modified structure of financial capital							
1. Equity	424 943.0	1 011 228.0	2 304 489.0	2 812 995.0	2 728 533.0	2 630 573.0	2 550 580.0
1.1. Equity without capital in revaluations	56 550.0	63 852.0	69 634.0	71 201.0	–12 718.0	–100 056.0	–179 712.0
1.2. Capital in revaluations	368 393.0	947 376.0	2 234 855.0	2 741 794.0	2 741 251.0	2 730 629.0	2 730 292.0
2. Debt	632 606.0	943 773.0	1 875 717.0	2 344 688.0	2 194 910.0	1 742 552.0	1 515 076.0
2.1. External liabilities	629 282.0	939 109.0	1 682 528.0	2 217 341.0	1 642 941.0	1 442 459.0	1 365 187.0
2.2. Internal liabilities	3 324.0	4 664.0	193 189.0	127 347.0	551 969.0	300 093.0	149 889.0

Table A.10. Modified structure of economic assets and financial capital PJSC "Zaporizhzhya OEP", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	x	x	x	79 004.0	77 808.0	97 249.0	98 266.0
1.1. Mobile financial assets	x	x	x	8.0	438.0	13.0	168.0
1.2. Non-mobile financial assets	x	x	0.0	78 996.0	77 370.0	97 236.0	98 098.0
2. Non-financial assets	x	x	503 287.0	458 744.0	428 163.0	403 532.0	434 684.0
2.1. Liquid non-financial assets	x	x	35 418.0	492.0	4 814.0	5 093.0	5 344.0
2.2. Non-financial illiquid assets	x	x	467 869.0	458 252.0	423 349.0	398 439.0	429 340.0
3. Non-mobile financial and liquid non-financial assets	x	x	35 418.0	79 488.0	82 184.0	102 329.0	103 442.0
4. Mobile financial assets	x	x	x	8.0	438.0	13.0	168.0
5. Non-mobile assets	x	x	503 287.0	537 740.0	505 533.0	500 768.0	532 782.0
6. Liquid assets	x	x	35 418.0	79 496.0	82 622.0	102 342.0	103 610.0
7. Non- illiquid assets	x	x	467 869.0	458 252.0	423 349.0	398 439.0	429 340.0
Modified structure of financial capital							
1. Equity	x	x	503 287.0	508 079.0	502 783.0	499 771.0	497 814.0
1.1. Equity without capital in revaluations	x	x	405 738.0	415 807.0	414 783.0	411 789.0	409 832.0
1.2. Capital in revaluations	x	x	97 549.0	92 272.0	88 000.0	87 982.0	87 982.0
2. Debt	x	x	x	29 669.0	3 188.0	1 010.0	35 136.0
2.1. External liabilities	x	x	x	29 664.0	1 662.0	1 004.0	35 132.0
2.2. Internal liabilities	x	x	0.0	5.0	1 526.0	6.0	4.0

Table A.11. Modified structure of economic assets and financial capital PJSC "Zaporizhzhya OFF", thousand UAH (source: authors' calculations)

Components	In fact on:						
	31.12.2013	31.12.2014	31.12.2015	31.12.2016	31.12.2017	31.12.2018	31.12.2019
Modified structure of economic assets							
1. Financial assets	191 751.0	222 528.0	329 857.0	318 755.0	304 790.0	304 991.0	442 516.6
1.1. Mobile financial assets	41.0	5 518.0	11 677.0	62.0	2.0	24.0	5.9
1.2. Non-mobile financial assets	191 710.0	217 010.0	318 180.0	318 693.0	304 788.0	304 967.0	442 510.7
2. Non-financial assets	619 084.0	761 720.0	687 936.0	150 573.0	136 854.0	160 785.0	166 210.3
2.1. Liquid non-financial assets	37 875.0	116 797.0	56 560.0	9 442.0	3 587.0	28 122.0	1 963.2
2.2. Non-financial illiquid assets	581 209.0	644 923.0	631 376.0	141 131.0	133 267.0	132 663.0	164 247.1
3. Non-mobile financial and liquid non-financial assets	229 585.0	333 807.0	374 740.0	328 135.0	308 375.0	333 089.0	444 473.9
4. Mobile financial assets	41.0	5 518.0	11 677.0	62.0	2.0	24.0	5.9
5. Non-mobile assets	810 794.0	978 730.0	1 006 116.0	469 266.0	441 642.0	465 752.0	608 721.0
6. Liquid assets	229 626.0	339 325.0	386 417.0	328 197.0	308 377.0	333 113.0	444 479.8
7. Non- illiquid assets	581 209.0	644 923.0	631 376.0	141 131.0	133 267.0	132 663.0	164 247.1
Modified structure of financial capital							
1. Equity	253 479.0	229 361.0	317 955.0	–217 831.0	–281 122.0	–262 865.0	–266 440.2
1.1. Equity without capital in revaluations	1 824.0	–21 381.0	67 491.0	–370 540.0	–433 831.0	–415 574.0	–419 443.4
1.2. Capital in revaluations	251 655.0	250 742.0	250 464.0	152 709.0	152 709.0	152 709.0	153 003.2
2. Debt	557 356.0	754 887.0	699 838.0	687 159.0	722 766.0	728 641.0	875 167.1
2.1. External liabilities	547 715.0	740 721.0	690 105.0	686 400.0	722 260.0	728 169.0	874 878.0
2.2. Internal liabilities	9 641.0	14 166.0	9 733.0	759.0	506.0	472.0	289.1