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## FINANCIAL SUSTAINABILITY MODELLING AND ESTIMATION OF THE PUBLIC JOINT- STOCK COMPANY «NATIONAL SHAREHOLDER COMPANY «NAFTOGAZ OF UKRAINE»

*The current stage of development of a public joint-stock company «National Joint-Stock Company «Naftogaz of Ukraine» is characterized by an increase of negative trends. The main retaining factors for the enterprise development are the complex economic and political situation in the country, the negative dynamics of the main macroeconomic indicators, the high cost of the UAH resource, and the dominant devaluation processes.*

*One of the conditions for a stable financial and economic development of the industrial enterprises is the proper management of the movement of their financial resources. Consequently, in the case of consideration of the enterprise, it is necessary to proceed from the fact that the key role is played by continuous financial processes, which should be understood as the sequence of tasks or procedures that collectively provide the completion of a particular production activity.*

*The formation of a market financial and credit system requires enterprises to increase the efficiency of activities, competitiveness of petroleum products and services based on the implementation of scientific and technological progress, effective forms of management and management of the enterprise.*

**Key words:** *public joint stock company, financial indicators, factor analysis, variational networks, company profits.*

**В. М. Краєвський, Н. В. Параниця. Моделювання та оцінка фінансової стійкості діяльності публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України»**

*У роботі проведений аналіз фінансових показників публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України». Нами пропонується системний підхід моделювання та оцінки фінансової стійкості підприємства, заснований на моделі*

варіаційних мереж. Висвітлено результати факторного аналізу прибутку підприємства. Запропоновано методик аналізу впливу ключових факторів на зміну прибутку підприємства. Сучасний етап розвитку публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України» характеризується посиленням негативних тенденцій. Основними стримуючими чинниками розвитку підприємства є складна економіко-політична ситуація в країні, негативна динаміка основних макроекономічних індикаторів, висока вартість гривневого ресурсу, домінуючі девальваційні процеси.

Актуальність дослідження підвищується в умовах складних економічних процесів, що відбувалися упродовж останніх років в Україні – зниження доступу вітчизняних підприємств до фінансових ресурсів кредитних установ, зниження динаміки зростання вітчизняного ринку нафтогазових продуктів, скорочення попиту на продукцію вітчизняних експортно-орієнтованих підприємств змушує шукати кошти забезпечення збуту в умовах різкого підвищення конкуренції в різних сегментах ринку. Управління фінансовою стійкістю, використання певних інструментів на внутрішньому, регіональному і макроекономічному рівнях – це одна з актуальних фінансово-економічних проблем. Однак недооцінка теорії і практики управління стійкістю, нерозуміння і невикористання її інструментарію може призвести до ще більш негативних наслідків. Загалом існують різні підходи до трактування поняття фінансової стійкості, визначення її структури, а також обґрунтування шляхів управління фінансовою стійкістю, а тому доцільно провести аналіз фінансових показників публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України».

Мета статті – запропонувати системний підхід моделювання та оцінки фінансової стійкості підприємства, заснований на моделі варіаційних мереж. Здійснити оцінку фінансової стійкості публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України». Дослідити вплив величини банківського потенціалу на процеси кредитування підприємства.

Таким чином, за допомогою детального аналізу основних макроекономічних показників взаємодії банківського та реального секторів, а також багатовимірного статистичного аналізу було визначено найбільш впливові фактори побудови відносин банків та підприємств. Отже, за допомогою моделювання фінансової стійкості підприємства можна об'єктивно визначити всі варіанти розвитку підприємства. Моделювання дозволяє своєчасно вносити зміни в програму розвитку підприємства й ефективно управляти ресурсами підприємства для досягнення максимального фінансового результату.

**Ключові слова:** публічно-акціонерне товариство, фінансові показники, факторний аналіз, варіаційні мережі, прибуток підприємства.

**The purpose of the article.** To offer a systematic approach to modeling and assessing of the financial sustainability of an enterprise, based on variation network models. To assess the financial sustainability of the «National Joint-Stock Company «Naftogaz of Ukraine». To investigate influence of the size of the banking potential on the processes of crediting to the enterprise.

The analysis of recent investigations and publications, allocation of previously unsettled parts of the general problem. The problems of modeling and evaluating the financial sustainability of enterprises were studied by such economists as I. S. Gutsal [3], O. M. Philippe [4], S. V. Onishko [5], O. M. Melnik, V. M. Kremen, O. A. Otchenkohenka [7] and others.

Despite numerous studies, the current stage of development of industrial enterprises is characterized by an increase in negative trends. Few investigated remain the main reasons for the loss-making of joint stock companies. Therefore, the development and practical application of a systematic approach to modeling and assessing financial sustainability of an enterprise, based on models of variational networks, are relevant, which predetermined the choice of research topic.

**Presentation of the main material.** The current stage of development of a «Public Joint-Stock Company «National Joint-Stock Company Naftogaz of Ukraine» is characterized by an increase of the negative trends. The main retaining factors of the enterprise development are the complex economic and political situation in the country, the negative dynamics of the main macroeconomic indicators, the high cost of the UAH resource, and the dominant devaluation processes.

In such conditions, a significant role is assigned to the analysis of the enterprise's activity, which justifies the strategy and tactics of its development, clarifies plans and management decisions, monitors their implementation, identifies financial reserves, evaluates the performance of management personnel, individual units and the enterprise as a whole.

The financial stability of «National Joint-Stock Company «Naftogaz of Ukraine» should be evaluated by using a synthetic indicator calculated as the sum of values from the normalized coefficients (multiplier of authorized capital, total liquidity index, return on assets). The results of calculations are given in Table 1.

Table 1

**Dynamics of the financial stability indicators of «National Joint-Stock Company «Naftogaz of Ukraine» since 01.01.2013 to 01.01.2017**

By 01.01. year	Indicator	Equity	Statutory capital	Liabilities	Total assets	Coefficient of the capital multiplier (row 4 / row 2)	Reliability coefficient (row 1 / row 3)	Financial leverage coefficient (row 3 / row 1)	Coefficient of equity in the formation of assets (row 1 / row 4)
		E	SC	L	TA	Cmc	KCr	KCfl	Cea
2013		16626329	14211516	43540229	59926579	4,22	00,38	20,62	0,28
2014		17646979	13691182	42 392 804	59019133	4,25	00,39	20,55	0,28
2015		17646979	14496000	56 321 499	73968478	5,10	00,31	33,19	0,24
2016		18 118 147	15 537 900	67 877 389	85995536	5,53	00,27	33,75	0,21
2017		20455511	15829632	83 112 579	103 568 090	6,54	00,25	44,06	0,20

Source: calculated by the author based on data [1–2].

We propose a systematic approach to modeling and assessing financial sustainability of an enterprise, based on variation network models. Thus, the system of assessing the financial stability of an enterprise can be presented as a variation network, which, as nodes, will have coefficients. This will allow not only to express each node (indicator) through the linear combination of its neighbors, but react in a timely manner to changes, since the network is a variational one. Thus, we obtain a linear model, which evaluates the financial stability of the enterprise [3]:

$$Y = a + b \cdot I1 + c \cdot I2 + d \cdot I3. \quad (1)$$

Where  $Y(Cmc)$  is the coefficient of the capital multiplier;

$I1(Cr)$  – coefficient of reliability;

$I2(Cfl)$  – coefficient of financial leverage;

$I3(Cea)$  – coefficient of equity in the formation of assets.

Input addends in the considered linear combination are the coefficients that characterize the regulated and managed processes of the enterprise. By regulating these parameters, it is possible to achieve a certain level of profitability and efficiency of the enterprise. That is, it is necessary to influence actively the values that can be changed through the implementation strategies in order to achieve the aggregate asset quality and financial sustainability. Thus, the linear equation is obtained:

$$Y = -1,374 + 9,601 \cdot I1 + 1,425 \cdot I2 - 4,778 \cdot I3. \quad (2)$$

It can be concluded that the financial stability of the enterprise is positively influenced by the coefficient of reliability and the coefficient of the financial leverage, and the negative impact has the coefficient of equity in the formation of assets. This network is stable. This feature of stability of the variational network allows to maintain in a stable condition not only individual enterprises, but the economy as a whole. Thus, financial stability, provided with the help of a variation network, can increase the competitiveness of enterprises and facilitate their rapid adaptation to a changing economic environment. With the help of linear combinations, it is possible to express each parameter (standard or index). The recommended values of the relevant indicators express their absolute weight when assessing the quality of assets.

The main reasons for the unprofitability of public stock company «National Joint-Stock Company «Naftogaz of Ukraine» are the adoption of ineffective management decisions, non-compliance with legislative acts and other factors that negatively affect the use of state property, income and solvency of the enterprise.

It should be noted that the models of management of working capital of enterprises differ in terms of participation in them of debt financing. Consequently, the loan has an important role in managing the development of the enterprise. In addition, the financial and credit relations of the enterprise in attracting loans provide the opportunity to use the effect of the «tax shield» [4], which at the expense of reducing the income tax by deducting the cost of borrowing funds for the costs of the enterprise.

Modern anti-crisis programs of Western countries foresee financial responsibility of economic entities. For example, the anti-crisis programs of the USA, Australia, Western European countries, contain clear principles that are as follows [6]:

- managers of enterprises and banks must pay for mistakes;
- taxpayers should not pay for mistakes of the financial institutions;
- the mechanisms of state financial support to enterprises should be transparent.

According to the strategy of development of the financial sector of Ukraine till 2020, measures are foreseen in order to increase the protection of the rights of creditors, depositors and clients, namely [6]:

- improvement of the disclosure procedure in the process of reporting public information about the banks to their owners and major shareholders; the creation of legal mechanisms in order to counteract the establishment of bankruptcy by unscrupulous persons;
- establishment of criteria for assessing the business reputation of the bank's founders and increasing requirements for buyers of bank shares;
- providing favorable conditions for the development of modern forms of lending, while improving the mechanism of protecting the rights of creditors and consumers of banking services;
- establishment of a network of rating agencies as independent appraisers of the financial condition of banks and their risks [6];
- simplification and unification of the procedure for collecting a lien against a pledge item and satisfaction of collateral-secured claims of creditors;
- application of out-of-court procedures for foreclosure of immovable property, which is the subject of collateral, by granting the mortgagee the right to conclude notarized transactions with the pledgers – legal entities at any time of the obligation, and not only after the grounds for foreclosure of the pledged property;
- improvement of the system of registration of real rights to real estate and their restrictions;
- improvement of liquidation mechanisms of banks, which revoked licenses for banking operations, creation of the institute of corporate liquidators;
- amendments to the Law of Ukraine «On the Guarantee Fund for Individuals Deposits» regarding its financing, in order to increase the capitalization and financial capacity of the Fund, in particular by transferring to the Fund up to 20 % of excess of income over expenditures of the National Bank of Ukraine, placement of investments of the Fund along with state securities in mortgage securities, distribution of state guarantees for deposits in banking metals;
- the spread of the practice of resolving legal conflicts through the work of arbitration courts and the introduction of a financial ombudsman institution.

Determination of priority types of entrepreneurial activity should be considered as the first step in the construction of mechanisms for financial and credit support for their development. The next step is to adopt and approve, at the state and regional levels, financial and credit levers that stimulate the development of priority areas of entrepreneurship, the definition of sources of funding, forms and methods of financial support. At this stage, it is advisable to apply a differentiated approach, with the definition of specific forms of support for each of the above types of priority business [3, p. 119].

Thus, the low activity of financial and credit relations in the area of lending to enterprises, despite the excess liquidity of banks, is motivated by three main reasons:

- the lack of potential creditworthy and competitive borrowers among enterprises;
- high loan rates, for small and medium enterprises;
- the requirements of the NBU led to the impossibility of providing the foreign currency loans.

It is worthwhile to comment that the government and the NBU failed to take appropriate measures to minimize the risks that arose during the pre-crisis periods, namely:

- dependence of the economy on the USA dollar;
- growth of the share of foreign capital in the banking system to 40 %;

- insufficient lending volume by an acceptable percentage;
- significant negative trade balance.

The lack of general goals and concerted actions of the government and the NBU led to the most negative consequences of the crisis for Ukraine among all European countries. In the period 2008-2009, only IMF (International Monetary Fund) lending allowed to avoid a systemic sociol-economic and political crisis. The large banks with Ukrainian capital were sensitive to the financial crisis. Precondition for this, in our opinion, has become a permanent targeted policy of banks to maximize the activity to resell the bank to foreign investors. For this purpose, banks without a risk assessment increased the loan portfolio, predictably expanding the network without assessing the reality of the repayment of loans.

In order to prevent possible financial difficulties in the real economy, state policy should aim at introducing a system of continuous monitoring of the balance of assets and liabilities of enterprises of the real economy sector, regardless of their ownership, and preventing the possible concentration of agricultural land owned by the non-agricultural enterprises [5].

Summing up the aforementioned, it can be concluded that the main imbalances in establishing financial and credit relations between enterprises and banks in the crisis and after the crisis period are:

- during the crisis in Ukraine there is a strong decline in real lending to all major customer groups (corporations, households); within the corporate sector, small and medium-sized enterprises are most affected by the crisis;
  - Ukraine needs analytical tools to assess supply on the lending market, such as banking lending reviews as the main source of information for central banks in developed and developing countries;
  - sufficient capitalization of the banking sector is a key factor in the final restoration of lending to the economy. The strict obligation to fulfill existing capital requirements must be ensured by the NBU. The main point in this is the more stringent control over the compliance of banks with the capital requirements;
  - state banks may slightly improve the lending situation within the limits of credit mandates. However, banks that have recently recapitalized with the state should not be used for the direct lending;
  - withdrawal of the prohibition of foreign currency lending. Instead, less radical measures to avoid lending in foreign currency should be introduced, such as the establishment of higher levels of reserve for such loans. If removal of the ban is impossible politically, at least the effect of the anti-crisis legislation should not continue;
  - monetary policy can not actively help to eliminate the lack of lending. The main task of the National Bank of Ukraine is to guarantee the stability of the banking sector through the use of numerous macroeconomic instruments and regulatory policy instruments.
- The results of the analysis revealed, that the main factors of the functioning and development of financial and credit interaction between banks and enterprises are:
- NBU discount rate;
  - market rate of the UAH to the basic foreign currency (US dollar);
  - interest rates of the bank on credit resources;
  - average profitability of the enterprises of the real sector of the economy;
  - profitability of operational activity of enterprises of the real sector of the economy;
  - volume of investments in fixed assets of enterprises;
  - volume of assets of banks.

**Conclusion.** Thus, with the help of a detailed analysis of the main macroeconomic indicators of interaction between the banking and real sectors, as well as multidimensional statistical analysis, the most influential factors of construction of relations between banks and enterprises were determined. Thus, by means of modeling financial stability of an enterprise it is possible to objectively define all variants of development of the enterprise. Simulation allows timely changes in the enterprise development program and efficiently manage the resources of the enterprise, to achieve maximum financial result.

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**В. М. Краевский, Н. В. Параница. Моделирование и оценка финансовой устойчивости деятельности публичного акционерного общества «Национальная акционерная компания «Нафтогаз Украины»**

*В работе проведен анализ финансовых показателей публичного акционерного общества «Национальная акционерная компания «Нафтогаз Украины». Нами предлагается системный подход моделирования и оценки финансовой устойчивости предприятия, основанный на модели вариационных сетей. Представлены результаты факторного анализа прибыли предприятия. Предложена методика анализа влияния ключевых факторов на изменение прибыли предприятия. Современный этап развития публичного акционерного общества «Национальная акционерная компания «Нафтогаз Украины» характеризуется усилением негативных тенденций. Основными сдерживающими факторами развития предприятия являются сложная экономико-политическая ситуация в стране, отрицательная динамика основных макроэкономических индикаторов, высокая стоимость ресурса гривны, доминирующие девальвационные процессы.*

**Ключевые слова:** публично-акционерное общество, финансовые показатели, факторный анализ, вариационные сети, прибыль предприятия.

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