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## ANALYSIS OF THE EFFECTIVENESS OF STATE FINANCIAL CONTROL OF THE NATIONAL JOINT STOCK COMPANY “NAFTOGAZ OF UKRAINE”

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## АНАЛІЗ ЕФЕКТИВНОСТІ ДЕРЖАВНОГО ФІНАНСОВОГО КОНТРОЛЮ НА ПІДПРИЄМСТВІ НАК „НАФТОГАЗ УКРАЇНИ“

**Purpose.** To identify the level of dependence of the effectiveness of fiscal policy of Ukraine on the development of domestic oil and gas industry and determine the ways of improving the system and mechanisms of state financial control at domestic oil and gas enterprises.

**Methodology.** To evaluate the degree of impact of the oil and gas industry on fiscal policy of Ukraine, methods of economic and mathematic modeling is used.

**Findings.** Low efficiency of the state financial control at the oil and gas enterprises is demonstrated.

**Originality.** It lies in determining the level of impact of the financial results of NJSC “Naftogaz of Ukraine” and other economic factors that characterize the dynamics of the development of domestic oil and gas industry on the national deficit with the help of economic and mathematic modeling.

**Practical value.** Ways to improve the state financial control over the use of budgetary funds allocated for the support of the domestic oil and gas industry, in particular, NJSC “Naftogaz of Ukraine”, are suggested.

**Keywords:** *fiscal policy, the state budget deficit, the state financial control, oil and gas industry, multifactor economic and mathematic modeling*

**Introduction.** Defining the role of government in the economy is one of the key research issues of the world economic science, which is especially relevant in the times of crisis influence on national economics.

The government due to its power and strategic objectives of economic policy determines the share of national income through the establishment of taxes, duties, fees, accumulation the profits of state enterprises and organizations. The percentage accumulated to the budget is used as a source of funding for national consumption, debt policy, law enforcement, internal and external security etc.

**Analysis of the resent research and publications.** While investigating the problems of the effectiveness of state economic regulation, J. Keynes proved that in the times of economic imbalances the mechanism of market competition is imperfect and unable to ensure the recovering of positive dynamics of production and enhance welfare, while the instruments of the state financial policy appear to be more effective in providing economic growth. Thus, at the beginning of the 20<sup>th</sup> century J. Keynes opposed the classical dogmas of political economy, primarily with regard to the question of the internal balance of the market economy and the dominance of monetary factors in providing reproductive processes in the national economy.

The Keynesian theory develops due to the increasing number of its contemporary economists [1]. The peri-

odical world and regional financial and economic crises leads to further studies of the problems of efficiency of government regulation policy and designing modern mechanisms of state influence on the economy both at the macro level and at the enterprise level in order to control adhering to the state interests.

State financial control is an integral part of the system of government regulation of the national economy, its sectors and enterprises that are strategically important in order to develop the national economic system. Exploring the theory of finance, we see that the prerequisite for the emergence of financial control is the control function.

It should be considered that the state-owned financial management involves the use of significant amounts of budget financing, which requires effective financial discipline. This leads to the existence of an effective institute of state financial control. According to H. Rosen and T. Gayer [2], expectations for the effective use of financial resources inextricably linked with government fiscal policy and budgetary expenditures.

Ukrainian economists have actively studied the international experience of formation of the effective state financial control and opportunities for implementation of its basic approaches in the national economic system. The research often focuses also on specific industries. Among prominent Ukrainian researchers of the effectiveness of state financial control problematics are I. K. Drozd, V. I. Nevidomyi, Yu. B. Slobodianyuk, I. B. Stefaniuk, V. O. Shevchuk and others.

**Unsolved aspects of the problem.** The activities of the NJSC “Naftogaz of Ukraine” and the state oil and gas companies that are the part of it as entities of the oil and gas complex of Ukraine are under the mechanisms and instruments of the state financial control. Annually significant budget financing is aimed to ensure the efficiency of the operations of the NJSC “Naftogaz of Ukraine”, due to their particular role in the development of the national economy and economic security.

These circumstances determine the relevance of the research of the state oil and gas companies, and the effectiveness of the state financial control of these companies.

To confirm, there was UAH 29.7 bn of budget expenditures in 2015 directed to cover the deficit of the NJSC “Naftogaz of Ukraine” by government bonds placement. The borrowed money at average rate of 14.5 % per annum was used to increase the share capital of NJSC “Naftogaz of Ukraine”.

Moreover, by such “indirect methods” the government and the National Regulatory Commission of Energy and Utilities of Ukraine (NRCEUU), as the national regulator of the energy market, actively influence the activity of the NJSC “Naftogaz of Ukraine” through establishing tariffs for gas and electricity [3]. “Indirect methods” were used because the Law of Ukraine “About State Budget of Ukraine for 2015” (so as the budget legislation the following years) did not provide direct funding of the NJSC “Naftogaz of Ukraine” from the budget.

Thus, the government is funding only deficit of the NJSC “Naftogaz of Ukraine” by new placements of government debt securities (bonds). Therefore, increasing deficit of the NJSC “Naftogaz of Ukraine”, the government increases the public debt, as well as the budget deficit.

Technically, it works when the government makes a new placement of debt securities (bonds) in order to increase the share capital of the NJSC “Naftogaz of Ukraine”. Then, the NJSC “Naftogaz of Ukraine” sells the government bonds to investors and thus receives liquid resources to finance the current needs. According to the market mechanisms of the global financial markets functioning, the NJSC “Naftogaz of Ukraine” has to sell government bonds in a competitive financial market, where any institution that sells and buys financial instruments in the stock market can be an investor. However, in terms of real demand in the Ukrainian stock market conditioned by the investment capital outflow because of political and economic imbalances, the National Bank of Ukraine acts as the main investor. It means that the central bank has to make an additional emission of national currency.

It is worth noting that by the EFF program between Ukraine and the IMF, limits were established earlier on the amount of purchases of government bonds to recapitalize the NJSC “Naftogaz of Ukraine”.

So, we can make an assumption about negative impact of the NJSC “Naftogaz of Ukraine” on budget deficit of Ukraine. Therefore, activity of the NJSC “Naftogaz of Ukraine” can also negatively affect the budgetary policy of Ukraine.

In our opinion, it is necessary to underline the insufficient scientific background of some problematic issues to investigate the effectiveness of public oil and gas companies that require substantial funding from the budget. It also causes an increase in budget deficit and low effectiveness of budgetary policy in Ukraine.

**Objectives of the article.** The purpose of this article is to identify the effectiveness of budgetary policy, which depends on the development of Ukrainian oil and gas sector and identify the areas to improve the system and mechanisms of state financial control of domestic oil and gas companies.

Therefore, an extremely important issue is the assessment of the effectiveness of state financial control of oil and gas companies, and, first of all, the efficiency of the NJSC “Naftogaz of Ukraine”.

**Presentation of the main research.** First, using econometric modeling methods it is advisable to test the effectiveness of state financial control at the enterprises of oil and gas industry, including the impact of the performance of the NJSC “Naftogaz of Ukraine” and other economic factors that characterize the dynamics of domestic oil and gas industry on the budget deficit. We need to create the multifactor econometric model using EViews 7.0 software package for statistical, economic, financial and other studies.

For this, we used the official quarterly statistics for the period from 01.01.2013 until 01.01.2016 (Table 1) that demonstrate the dynamics of Ukrainian oil and gas industry.

In particular, to analyze the effectiveness of state financial control, we need to make the following steps:

1. To determine separately the impact of net financial result of the NJSC “Naftogaz of Ukraine” on the budget deficit.

2. To create a multifactor econometric model using some macroeconomic indicators that demonstrate the dynamics of the oil and gas industry and with the activities of the NJSC “Naftogaz of Ukraine” that can influence the growth of the budget deficit.

In our opinion, the results of the multifactor econometric modeling will identify the level of dependence of the efficiency of budgetary policy of Ukraine on the development of domestic oil and gas industry, as well as highlight the ways to improve the state financial control of Ukrainian oil and gas companies, including the NJSC “Naftogaz of Ukraine”.

Firstly, we need to create a one-factor econometric model to determine the effect of net financial result of the NJSC “Naftogaz of Ukraine” on the budget deficit of Ukraine (Table 1).

The coefficient of determination  $R\text{-square} = 0.21$  demonstrated a very weak linear relationship. The result of Prob (F-statistic) = 0.13 demonstrated the inadequacy of the model.

Now let us create the multifactor economic and mathematical model of relation of the budget deficit to net financial result of the NJSC “Naftogaz of Ukraine” and some indicators of that demonstrate the dynamics of the oil and gas industry development in Ukraine.

Table 1

Macroeconomic indicators that could influence Ukrainian oil and gas sector development (used to create multifactor econometric models)

Period	Index of coke production, %	International price for brent, \$	Customs value of imported natural gas to Ukraine, USD	Official NBU exchange rate, UAH/USD	NBU rate, %	Liquidity of banking system of Ukraine, UAH bln	Government expenditures for energy sector, UAH mln	Retail turnover of light oil and gas, UAH	Cost of electricity for industrial enterprises, UAH	Net financial result of the NJSC "Naftogaz of Ukraine", UAH mln	Long-term debts of the NJSC "Naftogaz of Ukraine", UAH mln	Budget deficit of Ukraine, UAH mln ("-" deficit, "+" surplus)
Q1 '13	-21.30	112.32	421.85	7.99	7.50	26.50	3 922.00	5 103.77	96.82	-7 749.69	32 793.22	-4 523.07
Q2 '13	-17.40	101.64	412.70	7.99	7.50	23.91	3 922.00	6 414.87	100.56	-9 997.62	24 410.54	-18 217.44
Q3 '13	-13.80	110.03	397.85	7.99	6.50	26.23	3 922.00	7 080.00	102.57	-10 571.21	24 410.53	-12 468.86
Q4 '13	-10.80	109.78	393.50	7.99	6.50	27.35	3 922.00	6 499.07	103.24	-12 521.32	27 197.42	-29 497.30
Q1 '14	1.20	107.74	310.17	9.56	6.50	28.20	2 604.40	5 538.63	103.24	-25 305.75	33 148.43	-4 094.16
Q2 '14	-2.30	109.95	276.41	11.67	9.50	29.11	2 604.40	7 473.53	115.84	-51 595.22	34 713.66	-18 592.14
Q3 '14	-14.20	101.29	375.16	12.39	12.50	28.60	2 604.40	8 007.73	144.23	-62 474.67	36 643.35	-17 418.82
Q4 '14	-21.30	71.11	381.48	13.65	14.00	30.36	2 604.40	7 710.70	149.01	-85 044.81	26 611.56	-37 947.68
Q1 '15	-41.60	56.89	331.99	21.54	19.50	29.52	658.37	6 467.07	161.18	-21 901.14	36 996.96	4 168.86
Q2 '15	-37.40	65.31	285.92	21.20	30.00	25.17	658.37	7 534.40	168.66	-4 468.39	43 934.87	-6 278.04
Q3 '15	-26.50	51.58	261.68	22.73	27.00	26.99	658.37	7 850.13	180.24	233.67	41 100.80	10 902.69
Q4 '15	-19.10	43.82	233.34	25.51	22.00	26.73	658.37	7 398.70	182.50	-25 096.09	35 435.65	-53 961.03

Source: National Bank of Ukraine official statistics, State Statistics Service of Ukraine official statistics, the NJSC "Naftogaz of Ukraine" web-site data

After creating several multifactor econometric models, we chose the best one. The result of the chosen model clearly demonstrated the influence of the following factors on the growth of the budget deficit. Among these factors are: net financial result of the NJSC “Naftogaz of Ukraine”, the official NBU exchange rate, average customs value of imported natural gas to Ukraine, the index of coke production, the NBU rate, the cost of electricity for industrial enterprises, retail trade turnover of light oil and gas (Table 3).

Multiple regression equation

$$Y = -41275.0 * X_1 - 1957.1 * X_2 - 7831.5 * X_3 - 12027.4 * X_4 + 6616.6 * X_5 - 20.7 * X_6 + 1.1 * X_7 + 544390.1.$$

Where Y is the budget deficit; X1 is the official NBU exchange rate; X2 is the customs value of imported natural gas to Ukraine; X3 is the index of coke production; X4 is the NBU rate; X5 is the cost of electricity for in-

dustrial enterprises; X6 is retail turnover of light oil and gas; X7 is net financial result of the NJSC “Naftogaz of Ukraine”. R-squared = 0.91 demonstrated rather strong linear relationship.

Prob (F-Statistic) = 0.059 demonstrated the model adequacy with the significance level of 0.9, but also the inadequacy of the model with the significance level of 0.95.

Analysis of t-statistics and Prob (F-statistic) for each independent variable indicated the importance of all factors with the significance level of 0.95.

Durbin-Watson stat = 1.97 indicated the absence of autocorrelation. Testing the model on heteroskedasticity by the White criterion showed no heteroscedasticity.

**Conclusions and recommendations for further research.** Results of the created multifactor econometric model allowed confirming assumptions about Ukrainian budgetary policy dependence on the development of domestic oil and gas industry, including the significant

Table 2

Determination of the effect of net financial result of the NJSC “Naftogaz of Ukraine” on the budget deficit of Ukraine

Dependent Variable: BUDGETDEFICIT Method: Least Squares Date: 07/28/16 Time: 12:37 Sample: 2013Q1 2015Q4 Included observations: 12				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FINRESULT	0.318183	0.193158	1.647272	0.1305
C	-7268.710	7052.276	-1.030690	0.3270
R-squared	0.213435	Mean dependent var		-15660.58
Adjusted R-squared	0.134778	S.D. dependent var		18161.34
S. E. of regression	16893.18	Akaike info criterion		22.45822
Sum squared resid	2.85E+09	Schwarz criterion		22.53904
Log likelihood	-132.7493	Hannan-Quinn criter.		22.42830
F-statistic	2.713507	Durbin-Watson stat		2.029676
Prob (F-statistic)	0.130522			

Table 3

Determination of influence of the net financial result of the NJSC “Naftogaz of Ukraine” and other macroeconomic indicators that could influence Ukrainian oil and gas sector development on budget deficit

Dependent Variable: BUDGETDEFICIT (Y) Method: Least Squares Date: 07/28/16 Time: 12:55 Sample: 2013Q1 2015Q4 Included observations: 12				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X <sub>1</sub>	-41275.04	8492.290	-4.860296	0.0083
X <sub>2</sub>	-1957.088	407.9141	-4.797795	0.0087
X <sub>3</sub>	-7831.460	1634.659	-4.790885	0.0087
X <sub>4</sub>	-12027.38	3239.793	-3.712390	0.0206
X <sub>5</sub>	6616.569	1525.474	4.337385	0.0123
X <sub>6</sub>	-20.70331	6.607557	-3.133277	0.0351
X <sub>7</sub>	1.110253	0.271425	4.090453	0.0150
C	544390.1	112397.9	4.843420	0.0084
R-squared	0.906150	Mean dependent var		-15660.58
Adjusted R-squared	0.741914	S. D. dependent var		18161.34
S.E. of regression	9226.357	Akaike info criterion		21.33224
Sum squared resid	3.41E+08	Schwarz criterion		21.65551
Log likelihood	-119.9934	Hannan-Quinn criter.		21.21255
F-statistic	5.517345	Durbin-Watson stat		1.971763
Prob (F-statistic)	0.059077			

effect of expenditures for the NJSC “Naftogaz of Ukraine”. In this case, government should improve the system and mechanisms of state financial control for the domestic oil and gas enterprises.

In particular, in order to increase the efficiency of the state financial control of enterprises in the energy sector, it is an important task to organize the planning processes as an important part of the integrated system for optimizing financial support. Therefore, as a result of consistent implementation of mentioned measures, an optimal capital structure for the future period will be created that could ensure efficient use of financial resources and an effective level of risks determination [4].

However, in our opinion, in order to get the benefits from the government expenditures for state-owned enterprises of oil and gas sector, it is important to implement the following strategies in practice of the NJSC “Naftogaz of Ukraine” [4]:

1. The strategy for maximum return on equity in terms of the minimum possible loss of financial stability.

2. The strategy to maximize the borrowings effect in terms of the acceptable level of loss of financial stability.

In our opinion, the implementation of one of the above-mentioned strategies will increase the efficiency of using budget funds and lead to minimizing the impact of exogenous factors. As a result of the created multifactor econometric model, several exact macroeconomic factors are investigated, including the dynamics of the cost of imported natural gas for Ukraine, the cost of electricity for industrial enterprises, demand for the retail market in light of oil products and gas, etc. Therefore, it will improve the effectiveness of state financial control at the enterprises of the oil and gas complex of Ukraine, which is currently characterized by low efficiency of existing mechanisms and instruments.

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**Мета.** Виявити ступінь залежності ефективності бюджетної політики України від розвитку вітчизняного нафтогазового комплексу й визначити напрями вдосконалення системи та механізмів дер-

жавного фінансового контролю на вітчизняних нафтогазових підприємствах.

**Методика.** Для оцінки ступеня впливу нафтогазового комплексу на бюджетну політику України використані методи економічного й математичного моделювання.

**Результати.** Продемонстрована низька ефективність державного фінансового контролю на підприємствах нафтогазового комплексу.

**Наукова новизна.** Полягає у встановленні за допомогою економіко-математичного моделювання ступеня впливу на дефіцит державного бюджету результатів діяльності НАК „Нафтогаз України“ та інших економічних факторів, що характеризують динаміку розвитку вітчизняного нафтогазового комплексу.

**Практична значимість.** Запропоновані напрями вдосконалення державного фінансового контролю за використанням бюджетних коштів, що спрямовуються на підтримку вітчизняного нафтогазового комплексу, зокрема НАК „Нафтогаз України“.

**Ключові слова:** бюджетна політика, дефіцит державного бюджету, державний фінансовий контроль, нафтогазовий комплекс, багатофакторна економіко-математична модель

**Цель.** Выявить степень зависимости эффективности бюджетной политики Украины от развития отечественного нефтегазового комплекса и определить направления совершенствования системы и механизмов государственного финансового контроля на отечественных нефтегазовых предприятиях.

**Методика.** Для оценки степени влияния нефтегазового комплекса на бюджетную политику Украины использованы методы экономического и математического моделирования.

**Результаты.** Продемонстрирована низкая эффективность государственного финансового контроля на предприятиях нефтегазового комплекса.

**Научная новизна.** Заключается в установлении с помощью экономико-математического моделирования степени влияния на дефицит государственного бюджета результатов деятельности НАК „Нафтогаз України“ и других экономических факторов, характеризующих динамику развития отечественного нефтегазового комплекса.

**Практическая значимость.** Предложены направления совершенствования государственного финансового контроля за использованием бюджетных средств, направляемых на поддержку отечественного нефтегазового комплекса, в частности НАК „Нафтогаз України“.

**Ключевые слова:** бюджетная политика, дефицит государственного бюджета, государственный финансовый контроль, нефтегазовый комплекс, многофакторная экономико-математическая модель

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