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FINANCIAL PERFORMANCE OF UKRAINIAN ENTERPRISES DURING THE WAR

Purpose. To identify the profitability patterns of enterprises in various spheres and types of economic activity of Ukraine during the continued military conflict by quantifying the relationship between profitability and capital structure, business activity, and industry specifics.

Methodology. The empirical basis of the study consists of statistical indicators of business entities' activities aggregated by special groupings for the period 2014–2023. For the analysis, ten sections of economic activity (NACE) were selected, covering the key sectors of the national economy. The methodological framework of the research includes both general scientific and specific methods, namely: the method of abstraction (used to identify the main factors influencing the level of enterprise profitability), the method of induction (to extend the patterns identified in the sample to enterprises across all sectors of the Ukrainian economy), and the method of economic and mathematical modeling (to verify the hypothesis regarding the existence of cause-and-effect relationships between the level of profitability, capital structure, business activity, and type of economic activity of enterprises, and to construct a multifactor regression model based on the identified patterns).

Findings. The negative impact of the share of long-term liabilities in the capital structure and the positive impact of revenue growth on the return on assets during continued military conflict were revealed. In addition, it was found that return on assets, *ceteris paribus*, varies by spheres and types of economic activity.

Originality. The patterns are identified of change of return on assets of enterprises during continued military conflict depend on the share of long-term liabilities in the capital structure, the annual growth rate of revenue, and the impact of industry specifics.

Practical value. The results of the study can be used both at the level of individual enterprises and at the national level. To increase the profitability of assets, it is recommended that enterprise management optimize the capital structure in favor of, first and foremost, own sources of financing and, secondly, short-term liabilities, as well as increase business activity. In addition, it is proposed to introduce a special tax regime for Fortetsia.City, which provides for increased tax rates on labor and limits on reserving military conscripts, which will make it possible to reduce the state budget deficit and preserve human capital.

Keywords: *war, business activity, economic and mathematical modeling, enterprise, profitability, capital structure*

Introduction. Since 2014, Ukraine has continued to fight for its independence in a war unprecedented in modern European history. During this time its economy has undergone significant changes, yet it continues to function.

During the first year of the military conflict, parts of Luhansk and Donetsk regions were occupied, where a significant share of enterprises in the mining and manufacturing industries, as well as in the energy sector, had been concentrated. In addition, the Autonomous Republic of Crimea, known for its considerable recreational potential and well-developed agricultural sector, was also occupied. According to the World Bank, Ukraine's GDP decreased by 11.31 billion USD (in constant 2015 prices), from 112.2 billion USD in 2013 to 100.89 billion USD in 2014, which represents a 10 % decline.

The impact of the full-scale invasion in 2022 was even more substantial. As a result of the renewed offensive, a significant part of Zaporizhzhia and Kherson regions was occupied, while parts of Kyiv and Kharkiv

regions, although liberated later that same year, faced severe limitations in restoring normal business activity. In 2022, Ukraine's GDP fell by 28 % (from 101.5 billion USD in 2021 to 72.31 billion USD), and overall, during the ten years of the military conflict (2014–2023), GDP declined by 32 % compared to 2013 [1].

In response to the aggression, the government increased funding for the Armed Forces of Ukraine, and the share of military expenditures rose from 2.4 to 36.7 % of GDP over the corresponding period, which by the end of 2023 accounted for the majority of all state budget expenditures [2].

Studying the Ukrainian experience of enterprise operations under wartime conditions is of considerable importance for world scholarship, as it provides a basis for justifying ways to minimize the consequences of modern armed conflicts, identifying the types of economic activity most resilient to wartime factors, and outlining post-conflict recovery trends.

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The analysis of the current position of the national economy and the identification of its strengths and weaknesses should form the basis for developing new and revising existing legal and regulatory acts in the sphere of public financial policy, as well as for defining the vectors of Ukrainian business development under conditions of military-political tension and heightened uncertainty.

Literature review. The issue of the financial efficiency of economic activity has attracted, and continues to attract, significant interest among scholars both in Ukraine and abroad.

An assessment of recent international studies on the determinants of profitability is presented in Table 1.

As for Ukrainian enterprises, the issue of improving the efficiency of their activities has been examined in a number of publications, among which the following may be highlighted:

1. “Financial performance determinants of Ukrainian agricultural companies in the pre-war period,” which, based on 2015–2021 data, identified a negative effect of the share of debt financing and of capital intensity (the ratio of assets to revenue) on return on assets, while for return on equity only the negative effect of capital intensity was statistically significant [23].

2. “Profitability management of enterprises in the Agricultural sector of Ukraine: analysis of development trends and modelling,” which, using 2010–2021 data, constructed a forecasting model of the relationship between the profitability of agricultural enterprises and margins and capital structure. It found that an increase in profit margin positively affects return on equity, while the effect of financial leverage is negative [24].

3. “Profitability determinants of companies in IT industry: case of Ukraine”, which found for 2013–2020 a positive effect of asset turnover and of the share of current assets in total assets, as well as a negative effect of the share of long-term liabilities and provisions in capital on return on assets [25].

4. “Determinants of agricultural companies’ financial performance: The experience of Poland, Slovakia and Ukraine,” which showed that in 2017–2020, for Ukrainian enterprises, the most significant influences on return on assets were the share of debt financing and capital intensity, and on return on equity the share of debt financing and asset liquidity [26].

5. “Nexus between risk factors and financial performance: The case of Ukrainian advertising and marketing companies,” which made it possible to identify the influence of company size, financial leverage, and mar-

ket tenure on return on equity and return on assets in 2022 [27].

6. “Factor analysis of financial performance and formation of strategic resilience in Ukrainian IT companies under the challenges of war,” which identified as key performance drivers the structure of funding sources, asset turnover, profitability, and cost structure in 2021–2022 [28].

Thus, based on the available empirical evidence, capital structure, typically measured by the share of current and long-term liabilities in total capital or by their combined value, tends to have a predominantly negative effect on profitability indicators such as return on assets (ROA) and return on equity (ROE). In other words, a higher reliance on borrowed funds is generally associated with lower financial performance, reflecting the increased cost of servicing debt and the growing sensitivity of enterprises to external risks.

At the same time, business activity, which is commonly measured through the rate of revenue growth or the ratio of revenue to current assets (and sometimes the inverse), shows a positive influence on business profitability. Higher turnover and dynamic sales expansion typically indicate efficient use of assets, better resource allocation, and stronger market responsiveness. This suggests that in most economic contexts, profitability is more likely to improve through operational efficiency and activity growth rather than through increased leverage.

Unsolved aspects of the problem. Based on the current state of scientific research, the comprehensive assessment of the relationship between capital structure, business activity, and enterprise profitability under a prolonged military conflict, as well as the consideration of sectoral characteristics, remains insufficiently explored.

Using the data from 2014 to 2023 on the activities of Ukrainian enterprises makes it possible to trace the trends in financial and economic performance under the conditions of an extended military conflict.

The patterns revealed through statistical analysis can serve as a basis for developing recommendations to improve financial management at the enterprise level and to shape state policy aimed at supporting priority sectors of the economy both during wartime and throughout post-war recovery.

Purpose. The purpose of the article is to identify the patterns in the formation of enterprise profitability across different sectors and types of economic activity in Ukraine under a prolonged military conflict through the quantitative assessment of the relationship between profitability, capital structure, business activity, and sectoral specificity.

Methods. The empirical base of the study consists of data from the State Statistics Service of Ukraine on the

Table 1

Results of studies on the determinants of profitability of foreign enterprises

No.	Article title	Study object	Results
1	“The impact of ownership and other corporate characteristics on performance of V4 companies” [3]	enterprises of the Czech Republic, Slovakia, Poland, and Hungary in 2010–2014	it was found that debt financing negatively affects return on assets
2	“Capital Structure and Corporate Performance: An Empirical Analysis from Central Europe” [4]	enterprises of Central Europe in 2019	

3	“Capital structure and firm performance: evidence of Germany under IFRS adoption” [5]	non-financial corporations in Germany in 1993–2016	it was found that debt burden and revenue growth rate positively affect profitability
4	“Capital structure and firm performance: Empirical evidence from a small transition country” [6]	non-financial corporations in Vietnam in 2007–2012	a negative relationship was identified between current and long-term liabilities in the capital structure, along with a positive effect of revenue growth on profitability
5	“Capital structure and firm performance of non-financial listed companies: Cross-sector empirical evidences from Vietnam” [7]	non-financial corporations in Vietnam in 2013–2018	
6	“The impact of capital structure on the performance of construction companies: A study from Vietnam stock exchanges” [8]	construction enterprises in Vietnam in 2014–2016	
7	“The Impact of Capital Structure on Firm Performance: Evidence from Vietnam” [9]	non-financial corporations in Vietnam in 2019–2023	
8	“Impact of capital structure on firm’s performance: Focusing on non-financial listed Egyptian firms” [10]	enterprises in Egypt in 2003–2016	a negative effect of both current and long-term liabilities in the capital structure on return on assets was established, while the share of long-term liabilities in capital positively affected return on equity
9	“The Impact of Capital Structure on Firm Performance: Empirical Evidence from Egypt” [11]	enterprises in Egypt in 2019–2023	
10	“The impact of capital structure on financial performance in Romanian listed companies” [12]	enterprises in Romania in 2003–2010	it was determined that company efficiency is higher when firms avoid debt financing and operate primarily on equity
11	“The financial performance of global information and communication technology companies” [13]	technology companies in the United States in 2013–2022	it was found that the debt-to-equity ratio negatively affected return on assets but positively affected return on equity, while asset turnover had a positive impact on both profitability indicators
12	“The impact of capital structure on company performance: empirical evidence from Kosovo” [14]	enterprises in Kosovo in 2015–2020	a negative effect of current and long-term liabilities in the capital structure, both jointly and separately, on return on assets was identified, and a positive effect of current liabilities in capital on return on equity was established; asset turnover also had a positive influence on enterprise profitability
13	“Capital Structure and Financial Performance of Moroccan Agricultural Small- and Medium-Sized Enterprises: Moderating Effects of Government Subsidies” [15]	agricultural enterprises in Morocco in 2019–2022	a negative effect of debt financing on return on equity and return on assets was revealed
14	“Capital Structure and Firm Performance: Evidence from Malaysian Listed Companies” [16]	enterprises in Malaysia in 1995–2011	a negative effect on return on assets and return on equity was found for such capital structure indicators as the share of current and long-term liabilities and overall debt financing
15	“Capital structure and Corporate performance of Nigerian quoted firms” [17]	enterprises in Nigeria in 2003–2007	a negative effect of debt financing on return on assets was identified
16	“Effects of capital structure on firm’s performance: Empirical study of manufacturing companies in Nigeria” [18]	manufacturing enterprises in Nigeria in 2003–2012	
17	“Impact of capital structure on financial performance of oil and gas firms in Nigeria” [19]	oil and gas enterprises in Nigeria in 2011–2020	a positive effect of short-term debt financing on return on assets was observed (while the effect of long-term debt financing remained negative)
18	“Relationship between Capital Structure and Performance of Non Financial Companies Listed In the Nairobi Securities Exchange, Kenya” [20]	enterprises in Kenya in 2006–2012	a negative effect of financial leverage on return on assets and return on equity was identified
19	“Impact of Capital Structure on Firm Performance: Evidence from Pakistani Firms” [21]	enterprises in Pakistan in 2007–2011	a positive effect of debt financing and asset turnover on return on assets was revealed
20	“Relationship of capital structure decisions with firm performance: A study of the engineering sector of Pakistan” [22]	enterprises in Pakistan in 2009–2013	a negative effect of financial leverage on return on assets and return on equity was confirmed

aggregated performance indicators of enterprises for 2014–2023 across ten main sections of economic activity (hereinafter referred to as NACE Sections) [29]:

1. Agriculture, forestry and fishing (Section A).
2. Mining and quarrying (Section B).
3. Manufacturing (Section C).
4. Electricity, gas, steam and air-conditioning supply (Section D).
5. Construction (Section F).
6. Wholesale and retail trade; repair of motor vehicles and motorcycles (Section G).
7. Transportation and storage, postal and courier activities (Section H).
8. Information and communication (Section J).
9. Financial and insurance activities (Section K).
10. Real estate activities (Section L).

As the key financial ratios reflecting enterprise performance efficiency, the study used the following indicators: return on assets (ROA), defined as the ratio of net profit or loss to total assets at the end of the corresponding year; re-turn on equity (ROE), calculated as the ratio of net profit to total equity at the end of the year; and net profit margin (NPM), expressed as the ratio of net profit to the total volume of goods and services sold during the year.

To evaluate the structure of assets and capital, the study considered the share of non-current assets in total assets, as well as the shares of current and long-term liabilities in total liabilities. To assess business activity, two indicators were applied: the annual revenue growth rate and asset turnover, measured as the ratio of total revenue to total assets for the given year.

Within the framework of this research, we identify the factors influencing enterprise profitability, conduct their quantitative assessment, and determine the key ones. After that, a mathematical model is constructed, its parameters are estimated, the model is tested for adequacy, and final conclusions are drawn.

The methodological basis of the study includes general scientific research methods. To identify the key determinants of enterprise profitability, the method of abstraction was used; to extrapolate the trends revealed in the data to the entire population of domestic enterprises, the method of induction was applied; and to compare various sectors and types of economic activity by their main financial indicators, the method of analogy was employed.

In addition, specific research methods were used, in particular ratio analysis for evaluating profitability, business activity, and capital structure. By means of economic and mathematical modeling, a multifactor regression model was developed that reflects real cause-and-effect relationships and can be written in the following form

$$y = \beta_0 + \beta_1 \cdot x_1 + \beta_2 \cdot x_2 + \dots + \beta_n \cdot x_n + \varepsilon,$$

where y is a dependent variable (in this case, the profitability indicator); x_1, x_2, \dots, x_n are independent variables (indicators characterizing capital structure, business activity, and NACE Section); $\beta_0, \beta_1, \dots, \beta_n$ are model parameters (constants) to be estimated; ε is an unobservable random error term.

All calculations were performed using the econometric software package Gretl.

Results. One of the key indicators of enterprise performance efficiency is return on assets (ROA), which

reflects the profitability generated by the resources available to a business. The data presented in Table 2 allow several important conclusions to be drawn. The calculations were carried out based on the data from the State Statistics Service of Ukraine on net profit (loss) of enterprises by types of economic activity [30] and on non-current and current assets, equity, and liabilities of enterprises by types of economic activity [31]:

- agriculture was the only NACE Section that remained profitable throughout 2014–2023. However, with the onset of the full-scale invasion, profitability fell sharply, and by the end of 2023 it had returned to the 2014 level. This can be explained by the occupation of new Ukrainian territories in 2022, the limited use of de-occupied areas due to the need for demining and their use for defense purposes, problems with maritime logistics caused by the virtual suspension of sea transportation until the grain corridor was opened, and the relatively high cost of road and rail transport. In addition, profitability in this section, compared to others, remained the most stable, as indicated by the value of the coefficient of variation;

- a similar situation was observed in the mining industry, which remained profitable starting from 2016. On average, its return on assets amounted to 6.6 %, the second-highest value after agriculture;

- the energy sector suffered one of the greatest losses, largely due to ongoing attacks on energy infrastructure, the occupation of the largest nuclear power plant in Europe, and the difficulty of aligning household tariffs with market prices. Consequently, this section remained largely unprofitable throughout the study period, with an average return on assets of –3.1 %;

- the information and communication sector demonstrated the most significant improvement in profitability, increasing from –18.1 % in 2014 to 14.1 % in 2023. A large share of companies redirected their operations from Russian clients toward North American and European markets. The industry also benefited from the experience of organizing remote work during the COVID-19 pandemic, while the absence of physical barriers to exporting services (unlike agricultural products) supported further inflows of human and financial capital;

- the trade sector showed the highest volatility in returns on assets, yet overall profitability improved from –11.4 % in 2014 to 3.9 % in 2023.

Taking into account the time structure of liabilities and provisions presented in Tables 3 and 4, several conclusions can be drawn (the calculations are based on the data from the State Statistics Service of Ukraine on non-current and current assets, equity, and liabilities of enterprises by types of economic activity [32]):

- for all sections except energy, there is a clear trend toward increasing financing from internal sources. Accordingly, there was a consistent reduction in the share of long-term debt sources across all NACE Sections except for the energy sector. While in 2014 the share of this type of financing ranged between 16.1 and 44.6 %, by 2023 it had declined to 6.9–24.9 %;

- the most significant reduction in long-term debt financing was observed in construction (–24.7 percentage points), real estate activities (–19.7 p.p.), manufacturing (–12.8 p.p.), and information and communication (–12.5 p.p.). The sectors least dependent on long-

term liabilities were agriculture (average share 8.1 %), trade (average share 12.1 %), and transportation (average share 14.6 %);

- the use of short-term financing sources varies considerably, allowing the identification of two groups of NACE Sections. The first group (manufacturing, energy, construction, trade, and real estate activities) finances more than 50 % of assets through this type of funding, with a clear trend toward further growth from these sources (except for trade, where the share of current liabilities decreased from 85.0 % in 2014 to 78.5 % in 2023). The second group (agriculture, mining, transportation, information and communication, and financial and insurance activities) covers up to 50 % of assets through current liabilities. Within this group, a clear downward trend in short-term financing was observed during 2014–2023 (except for mining, where the level of financing remained almost unchanged).

As for annual revenue growth, presented in Table 5 (calculated based on the data from the State Statistics Service of Ukraine on the volume of sold products,

goods, and services by types of economic activity [31]), the indicator was positive for the vast majority of NACE Sections. The only exception was 2022 (compared to 2021), when a slight increase was recorded only in the energy and information and communication sectors. The sharpest declines occurred in construction (–48.3 %), manufacturing (–30.5 %), agriculture (–25.9 %), and mining (–25.6 %).

Overall, during 2014–2023, the highest average annual revenue growth rates were observed in energy (17.9 %), information and communication (16.7 %), and agriculture (15.5 %), while the lowest rates were in manufacturing (10.4 %) and construction (10.2 %).

The first step in developing an economic and mathematical model of the relationship between enterprise profitability, capital structure, assets, and business activity is to examine the strength of the correlations among the respective financial ratios, as presented in the figure below. The results of the correlation analysis provide grounds to conclude that there is an inverse linear relationship between profitability indicators (ROA, NPM)

Table 2

Return on assets of enterprises in the main NACE Sections of Ukraine in 2014–2023, %

Sections	2014, %	2015, %	2016, %	2017, %	2018, %	2019, %	2020, %	2021, %	2022, %	2023, %	Change	Avg, %	CV
A	5.5	15.0	5.9	7.6	7.2	9.1	7.2	17.8	6.0	4.1	–1.4	8.5	0.49
B	–3.1	–6.5	3.7	10.4	14.1	11.3	6.3	19.5	3.7	6.5	+9.6	6.6	1.12
C	–12.2	–9.1	–2.2	0.5	1.6	3.1	–0.5	7.3	–5.3	0.5	+12.7	–1.6	3.37
D	–4.9	–6.4	–0.8	–1.5	–0.5	0.1	–6.9	1.8	–10.4	–1.5	+3.4	–3.1	1.17
F	–10.4	–8.3	–3.3	–1.4	1.0	2.5	–0.7	0.9	–2.8	0.2	+10.6	–2.2	1.77
G	–11.4	–6.3	–0.3	1.3	3.0	4.3	1.0	4.0	0.9	3.9	+15.3	0.0	128.41
H	–6.1	–1.7	0.6	–1.7	–2.4	0.9	0.8	2.0	–2.3	3.0	+9.1	–0.7	3.71
J	–18.1	–6.7	1.2	8.0	8.5	10.8	6.6	11.7	4.3	14.1	+32.2	4.0	2.31
K	–1.7	–2.9	–0.2	4.8	5.6	3.2	4.6	5.6	1.4	6.1	+7.7	2.6	1.18
L	–23.3	–12.6	–7.8	–2.9	–0.2	6.0	–4.6	1.8	–7.2	0.1	+23.4	–5.1	1.56
Max	5.5	15.0	5.9	10.4	14.1	11.3	7.2	19.5	6.0	14.1	–	–	–
Min	–23.3	–12.6	–7.8	–2.9	–2.4	0.1	–6.9	0.9	–10.4	–1.5	–	–	–

Notes: Min – minimum value, Max – maximum value, Change – change in the corresponding indicator in 2023 compared to 2014 (percentage points), Avg – average value, CV – coefficient of variation

Table 3

Share of long-term liabilities and provisions in the liabilities of enterprises in the main NACE Sections of Ukraine in 2014–2023, %

Sections	2014, %	2015, %	2016, %	2017, %	2018, %	2019, %	2020, %	2021, %	2022, %	2023, %	Change	Avg, %	CV
A	16.1	9.9	4.0	6.5	8.4	9.0	6.8	6.5	6.9	6.9	–9.3	8.1	0.38
B	19.6	16.5	15.5	13.6	12.6	13.0	18.3	15.1	12.4	12.5	–7.1	14.9	0.16
C	25.8	27.1	20.6	18.5	14.8	12.5	14.5	11.7	14.4	13.0	–12.8	17.3	0.30
D	21.2	24.6	22.5	23.5	27.7	24.6	26.9	23.3	22.2	22.6	+1.4	23.9	0.08
F	36.2	33.9	33.9	28.3	23.9	16.0	14.0	11.3	12.4	11.5	–24.7	22.1	0.44
G	17.0	18.1	15.3	14.8	10.8	9.6	9.4	8.3	9.0	8.1	–8.9	12.1	0.30
H	18.3	13.2	12.9	14.3	16.5	15.0	16.0	13.6	12.2	14.0	–4.2	14.6	0.12
J	31.9	21.7	31.7	30.7	26.6	21.0	29.1	24.7	21.0	19.5	–12.5	25.8	0.18
K	21.0	23.5	27.4	26.1	24.0	16.2	15.4	13.6	14.2	14.5	–6.5	19.6	0.26
L	44.6	45.6	43.7	42.0	36.1	25.2	26.5	23.5	26.3	24.9	–19.7	33.8	0.26
Max	44.6	45.6	43.7	42.0	36.1	25.2	29.1	24.7	26.3	24.9	–	–	–
Min	16.1	9.9	4.0	6.5	8.4	9.0	6.8	6.5	6.9	6.9	–	–	–

Notes: Min – minimum value, Max – maximum value, Change – change in the corresponding indicator in 2023 compared to 2014 (percentage points), Avg – average value, CV – coefficient of variation

Table 4

Share of current liabilities and provisions in the liabilities of enterprises in the main NACE Sections of Ukraine in 2014–2023, %

Sections	2014, %	2015, %	2016, %	2017, %	2018, %	2019, %	2020, %	2021, %	2022, %	2023, %	Change	Avg, %	CV
A	41.9	49.9	71.9	45.6	42.5	40.2	39.0	34.3	36.9	35.8	– 6.1	43.8	0.24
B	41.9	52.4	53.1	54.1	52.6	46.5	40.9	38.1	38.2	42.4	+ 0.5	46.0	0.13
C	56.3	62.7	70.4	74.8	74.9	68.8	67.6	66.0	65.1	69.7	+ 13.4	67.6	0.08
D	31.7	38.6	46.3	46.9	48.0	50.1	60.0	62.0	75.2	66.3	+ 34.6	52.5	0.24
F	62.7	71.3	70.6	77.0	77.5	81.7	83.0	83.9	85.4	84.8	+ 22.2	77.8	0.09
G	85.0	86.7	86.2	83.9	84.8	82.8	81.8	81.0	80.0	78.5	– 6.5	83.1	0.03
H	40.8	19.2	23.5	24.5	29.1	35.1	32.5	36.1	36.4	35.9	– 4.9	31.3	0.21
J	63.9	36.9	59.5	50.3	50.8	52.8	45.6	40.6	46.0	41.3	– 22.6	48.8	0.16
K	40.1	41.0	36.7	38.1	39.4	47.7	47.3	46.2	42.6	38.4	– 1.7	41.7	0.09
L	46.4	57.0	63.6	62.0	63.4	62.0	63.8	59.4	61.5	60.8	+ 14.4	60.0	0.08
Max	85.0	86.7	86.2	83.9	84.8	82.8	83.0	83.9	85.4	84.8	–	–	–
Min	31.7	19.2	23.5	24.5	29.1	35.1	32.5	34.3	36.4	35.8	–	–	–

Notes: Min – minimum value, Max – maximum value, Change – change in the corresponding indicator in 2023 compared to 2014 (percentage points), Avg – average value, CV – coefficient of variation

Table 5

Annual revenue growth in the main NACE Sections of Ukraine in 2014–2023, %

Sections	2014, %	2015, %	2016, %	2017, %	2018, %	2019, %	2020, %	2021, %	2022, %	2023, %	Change	CAGR, %	CV
A	32.8	69.4	11.4	12.6	15.6	5.9	8.8	51.7	–25.9	14.6	–18.13	15.5	1.27
B	–5.5	21.4	29.8	32.1	15.5	–1.6	–8.8	62.6	–25.6	9.3	14.79	12.4	1.85
C	7.8	23.5	16.3	24.6	15.7	–1.7	2.9	35.7	–30.5	23.2	15.43	10.4	1.50
D	3.0	20.1	35.2	11.3	13.7	3.1	27.7	48.1	7.9	1.7	–1.26	17.9	0.86
F	6.6	–5.0	18.8	30.5	36.7	22.5	13.3	21.6	–48.3	36.3	29.65	10.2	1.80
G	1.1	19.9	22.1	28.3	23.0	5.2	2.8	32.4	–18.4	29.6	28.51	14.9	1.06
H	–1.7	44.4	24.3	19.7	14.9	8.1	–8.2	16.5	–8.8	17.4	19.17	13.2	1.21
J	4.6	19.6	16.7	18.5	18.8	20.0	10.0	28.8	3.8	15.7	11.12	16.7	0.46
K	–36.5	26.6	–17.5	5.6	51.4	3.4	12.3	22.9	–16.1	54.7	91.17	13.3	2.62
L	9.7	36.6	13.6	16.4	16.4	16.7	–6.0	19.4	–18.4	35.3	25.58	13.2	1.13
Max	32.8	69.4	35.2	32.1	51.4	22.5	27.7	62.6	7.9	54.7	–	–	–
Min	–36.5	–5.0	–17.5	5.6	13.7	–1.7	–8.8	16.5	–48.3	1.7	–	–	–

Notes: Min – minimum value, Max – maximum value, Change – change in the corresponding indicator in 2023 compared to 2014 (percentage points), CAGR – compound annual growth rate, CV – coefficient of variation

and the shares of long-term and current debt liabilities (LTD, STD), and a direct relationship with the share of equity (EQ). In addition, the profitability indicators show a direct linear relationship with revenue growth (Sales).

To confirm the assumption about the relationship between enterprise profitability and the structure of capital and business activity, taking into account sectors and types of economic activity (NACE Sections), a linear regression model was used. In this model, ROA serves as the dependent variable, while LTD and Sales are included as factors, along with a NACE dummy variable to capture industry effects.

Based on this, the economic and mathematical model has the following form

$$ROA = \beta_0 + \beta_1 \cdot LTD + \beta_2 \cdot Sales + \beta_3 \cdot NACE + \varepsilon.$$

It should be noted that, due to multicollinearity, the variables *NCA*, *CA*, *EQ*, and *STD* were not included in the model. To achieve the stated objective, the following hypotheses were proposed:

Hypothesis 1 (H₁). Capital structure, measured by the share of long-term liabilities and provisions in the

total amount of financial resources, affects changes in enterprises' return on assets ($H_1: \beta_1 \neq 0$). Based on prior research, it is reasonable to expect, given the high cost of borrowed capital under conditions of military and political instability, a statistically significant inverse linear relationship, all else being equal.

Hypothesis 2 (H₂). Expansion of activity, measured by the annual growth rate of revenue, affects changes in Ukrainian enterprises' return on assets ($H_2: \beta_2 \neq 0$). A statistically significant direct linear relationship between revenue growth and ROA is expected, all else being equal.

Hypothesis 3 (H₃). Return on assets differs across sectors and types of economic activity ($H_3: \beta_3 \neq 0$).

The results of the regression analysis (Table 6) indicate that the model parameters are significant and the model is appropriate. Specifically, 65 % of the variation in enterprises' ROA is explained by the variables included in the model (Adjusted R-squared = 0.650805), and the F-test ($F(11, 88) = 17.77360, p < 0.0001$) shows that the model is statistically significant overall.

Hypothesis 1 was confirmed. An increase in the share of long-term liabilities and provisions within the capital

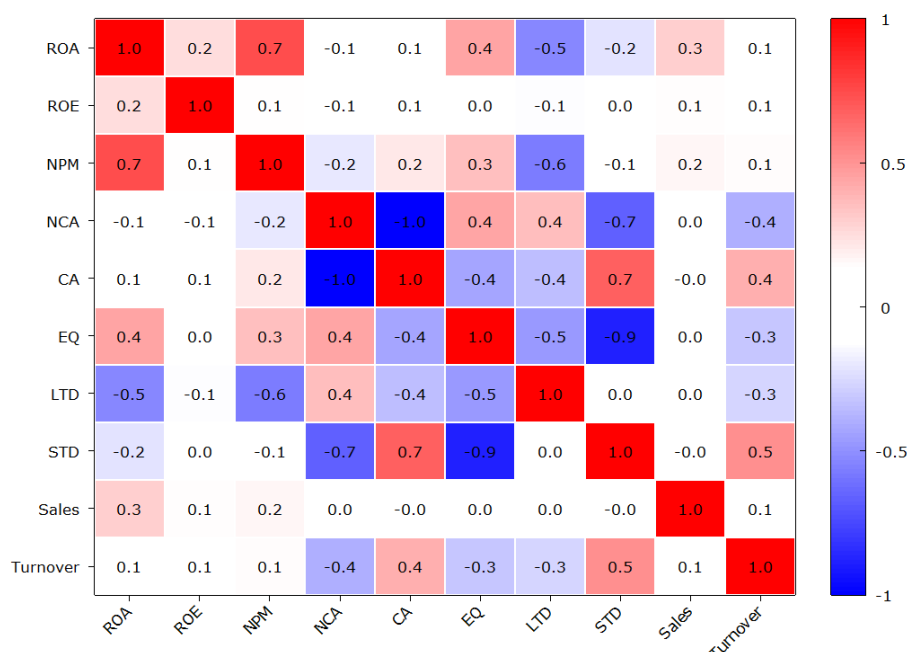


Fig. Correlation matrix of profitability, structure of capital and assets, and business activity indicators Notes:

ROA – ratio of net profit to total assets; ROE – ratio of net profit to equity; NPM – ratio of net profit to revenue; NCA – ratio of non-current assets to total assets; CA – ratio of current assets to total assets; EQ – ratio of equity to total liabilities and equity; LTD – ratio of long-term liabilities and provisions to total liabilities and equity; STD – ratio of short-term liabilities and provisions to total liabilities and equity; Sales – annual revenue growth rate; Turnover – ratio of revenue to total assets

structure is associated with a decline in return on assets. In practical terms, when LTD rises by one unit, ROA decreases by 0.50, all other factors held constant. This reflects the heavier servicing burden and higher risk premia on long-term borrowing under wartime conditions, which compress operating margins and, in turn, asset returns.

With respect to Hypothesis 2, the analysis shows a positive relationship between revenue growth and return on assets. When Sales increases by one unit, ROA increases by 0.09, ceteris paribus. Put simply, enterprises that expand their top line during the period under review are better able to convert that activity into bottom-line performance relative to the asset base.

In addition, the effect of external conditions differs across sectors, which produces different ROA outcomes

among the NACE Sections even when the financing mix and growth are the same. Relative to enterprises in Section J (Information and Communication), lower returns on assets, other things being equal, are observed for:

1. Manufacturing, on average by 0.10.
2. Electricity, gas, steam, and air conditioning supply, on average by 0.08.
3. Construction, on average by 0.08.
4. Wholesale and retail trade, and repair of motor vehicles and motorcycles, on average by 0.11.
5. Transportation, storage, postal, and courier activities, on average by 0.10.

Conclusions. The main scientific results of the study consist in identifying the key determinants of enterprise profitability in Ukraine under the conditions of military

Table 6

Results of the regression analysis

	Coefficient	Std. Error	t-ratio	p-value	
const	0.155448	0.0329323	4.720	<0.0001	***
LTD	-0.503348	0.0703838	-7.151	<0.0001	***
Sales	0.0936955	0.0178253	5.256	<0.0001	***
NACE: A	-0.0478095	0.0315679	-1.514	0.1335	—
NACE: B	-0.0264417	0.0348405	-0.7589	0.4499	—
NACE: C	-0.0958170	0.0294799	-3.250	0.0016	***
NACE: D	-0.0821885	0.0301924	-2.722	0.0078	***
NACE: F	-0.0787807	0.0294406	-2.676	0.0089	***
NACE: G	-0.108034	0.0308283	-3.504	0.0007	***
NACE: H	-0.100657	0.0299085	-3.365	0.0011	***
NACE: K	-0.0404501	0.0299053	-1.353	0.1796	—
NACE: L	-0.0490270	0.0332640	-1.474	0.1441	—

Notes: 1. The weighted least squares method was applied. 2. The baseline category in the model is enterprises in Section J (Information and Communication)

conflict – the capital structure, business activity, and sectoral specificity.

Enterprise management should focus on optimizing the capital structure in favor of, primarily, internal sources of financing, or, secondarily, short-term liabilities, while also using sectoral benchmarks to identify weaknesses in their financial strategies. The development of such sectoral benchmarks defines the main prospects for further research in this field.

In addition, businesses should actively expand into new markets, particularly those of the European Union and North America. These regions are Ukraine's main military and political partners and, therefore, may have a natural interest in Ukrainian goods, works, and services. Entering these markets would not only diversify risks but also strengthen economic resilience and create additional channels for sustainable growth.

The state policy for supporting priority industries during wartime and the post-war recovery period should pursue two key objectives: first, ensuring the replenishment of the state budget to cover expenditures on security and defense; and second, maintaining the stability and resilience of enterprises under conditions of economic uncertainty. In this regard, a promising initiative is the introduction of a special tax regime Fortetsia.City, which would include the following provisions:

- an exhaustive list of core types of economic activity whose enterprises are eligible to join this tax regime;

- the absence of outstanding debts to the state budget and social insurance funds during the 12 months preceding the acquisition of the Fortetsia.City resident status;

- the minimum average monthly wage of conscription-eligible full-time employees over the last reporting year must exceed the average monthly wage of full-time employees in the corresponding NACE Section published by the State Statistics Service of Ukraine, and in any case must not be lower than 2.5 times the statutory minimum wage for the respective year;

- a simplified procedure for obtaining the status of an enterprise critically important for the functioning of the economy and the livelihood of the population during a special period, by recognizing Fortetsia.City residency as an additional criterion of criticality, similar to the Diia.City regime;

- increased rates of taxes and fees on the remuneration of conscription-eligible full-time employees of Fortetsia.City resident enterprises (an income tax rate of 36 % instead of the standard 18 %, and a military levy rate of 10 % instead of the standard 5 %), accompanied by an increase in the permissible limit of reserved employees from 50 to 100 %;

- quarterly monitoring of enterprise compliance with the Fortetsia.City criteria.

Obtaining resident status under Fortetsia.City for enterprises would, on the one hand, increase businesses' confidence in their future and help preserve human capital as a fundamental basis for economic development. On the other hand, it would promote the formal employment of military-liable workers, which, in turn, would bring their labor income out of the shadow economy. This would contribute to reducing the state budget deficit by increasing tax and levy receipts at the higher rates applicable under this regime, and it would also lower the corruption risks associated with mobilization.

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Прибутковість підприємств України в умовах війни

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Мета. Виявлення закономірностей формування прибутковості підприємств сфер і видів економічної діяльності України в умовах тривалого воєнного конфлікту через кількісну оцінку взаємозв'язку прибутковості зі структурою капіталу, діловою активністю й галузевою специфікою.

Методика. Емпіричною основою дослідження є статистичні показники діяльності підприємств за 2014–2023 рр. (для аналізу обрано 10 секцій видів економічної діяльності, що охоплюють ключові сектори національної економіки). Методологічний базис дослідження включає загальнонаукові та спеціальні методи, а саме: метод абстрагування (для визначення основних факторів впливу на рівень прибутковості підприємств), метод індукції (для поширення виявлених у вибірці закономірностей на підприємства всіх секторів економіки України), метод економіко-математичного моделювання (для доведення гіпотези про наявність причинно-наслідкових зв'язків між рівнем прибутковості та структурою капіталу, діловою активністю, видом економічної діяльності підприємства й побудови багатофакторної регресійної моделі на підставі виявлених закономірностей).

Результати. Виявлено негативний вплив зростання частки довгострокових зобов'язань і забезпечень у структурі капіталу на рентабельність активів, а також позитивний вплив зростання виручки на рентабельність активів під час тривалого воєнного конфлікту. Крім того, встановлено, що рентабельність активів за інших рівних умов різниться залежно від секції.

Наукова новизна. Полягає у виявленні взаємозв'язку між рентабельністю активів підприємств в умовах тривалого воєнного конфлікту й часткою довгострокових зобов'язань і забезпечень у структурі джерел фінансування, річним темпом приросту виручки та впливом галузевої специфіки.

Практична значимість. Результати дослідження можуть бути використані як на рівні окремих підприємств, так і на загальнодержавному рівні. Для підвищення прибутковості активів керівництву підприємств рекомендовано оптимізувати структури капіталу на користь, у першу чергу, власних джерел фінансування та, у другу чергу, короткострокових зобов'язань, а також нарощувати ділову активність. Крім того, запропоноване впровадження особливого податкового режиму ФортецяCity, що передбачає підвищені ставки податків на оплату праці й ліміти бронювання військовозобов'язаних, що дасть можливість скоротити дефіцит державного бюджету та зберегти людський капітал.

Ключові слова: війна, ділова активність, економіко-математичне моделювання, підприємство, рентабельність, структура капіталу

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