

Behavioral Economics in Cyberspace
Practical Work No. 10

Assessing the level of economic security of an enterprise: determining criteria and calculating security indicators

Performed by students of group

Shtyrhun Khrystyna
Mezentseva Ksenia
Stadnyk Mariana
Sereda Sofia

IA-401 Meshcheryakova Anna
Boychuk Kateryna
Valikova Valeria
Yegorova Alina

INTRODUCTION

In today's conditions of economic instability, digital transformation and increased competition, social and communal enterprises are forced to pay special attention to ensuring their own economic security. The organization's ability to resist external and internal threats, rationally use resources, maintain financial stability and ensure the continuity of service provision depends on the effectiveness of the economic security system .

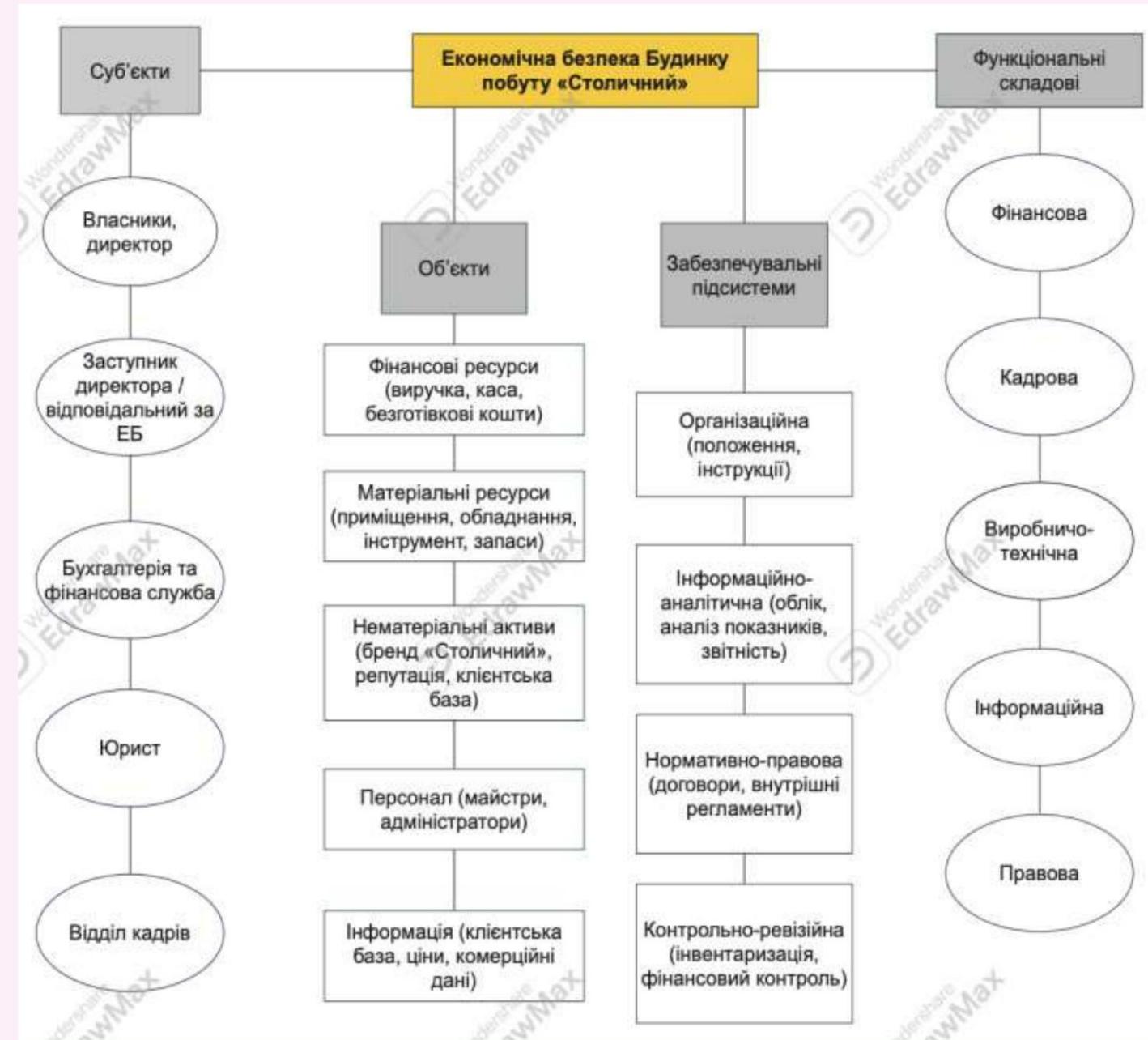
One of the key diagnostic tools is the indicator approach, which allows for a comprehensive assessment of the level of enterprise security based on financial, personnel, technical and technological, and other parameters. That is why, within the framework of this work, a comparative analysis of economic security is conducted using the example of two enterprises: **the Stolichnyi Household Building (Ukraine)** and the Norwegian company **Oddaprodukt AS**, which operates in the field of production and sales of food products.

As part of the practical work, an analysis of threshold and actual indicators of economic security of both enterprises was performed, an integral indicator of economic stability was constructed, the results obtained were compared , and proposals were made to improve the economic security management system.

Task 1

The structure of the economic security
of the enterprise

House of Life "Stolichny", Ukraine



Characteristics of the main approaches to assessing the level of economic security of the enterprise "Stolichny" House of Life, Ukraine

Indicator	The essence of the approach	Advantages of the approach	Disadvantages of the	Representatives
(threshold) approach	Assessment of the level of economic security based on a system of quantitative indicators with clarity; possibility of regular monitoring; easily established threshold values. For Stolichny, ratios, share of overdue accounts payable, share of inventory this is, for example: profitability, liquidity turnover, share of constant signals about dangerous clients, etc.	deviation.	approach: Difficulty in choosing the correct threshold values; does not take into account qualitative factors (reputation, staff motivation); individual indicators may contradict each other; does not show the reasons for deviations.	O. Vlasyuk, E. Oleinnikov, S. Ilyashenko, G. Pasternak-Taranushenko and others.
Resource-functional	The level of economic security is determined by the availability and efficiency of resources that limit security; the use of resources (financial, links the level of security with labor, material, information) in resource management; the breakdown of functional components. For the purpose of substantiating "Stolichny", they analyze whether investments in security (purchase of craftsmen, equipment, financing, equipment, programs, security) are sufficient. information support for performing security functions.		High labor intensity; detailed information about resources and Ponomaryov, O. Lyashenko et al. is necessary. costs; it is difficult to take into account intangible resources (image, customer trust).	
Functional	The assessment is carried out according to the main functional components of economic security: financial, personnel, technical and technological, information, legal, market, force, etc. Criteria, indicators and risk level are determined for each component of the House of Life.	Allows you to see "weak spots" in specific areas (for example, personnel or information security); convenient to form programs of measures for each component; well combined with the organizational structure of the enterprise.	Does not always show an integral level of security; duplication of indicators between components is possible; requires significant expert work.	M. Kyzym, S. Zabrodsky, V. Geyets etc.

Characteristics of the main approaches to assessing the level of economic security of the enterprise "Stolichny" House of Life, Ukraine

	The essence of	Advantages of the approach	Disadvantages of the approach	Representatives
Situational-objective approach	the approach The assessment is based on the analysis of specific threats to individual objects (cash register, equipment, customer base, personnel) in certain situations: demand crisis, change in legislation, increased competition, force majeure.	High practicality; allows for episodic evaluation, Representatives develop targeted anti-crisis measures for specific situations; results are difficult to compare with each other; significant management: V. Geyets, A. takes into account the specifics of the House of Life subjectivity of experts; without Thompson, etc.; in the field (for example, the risks of damage to things system operation may not be economic security - O. customers).	Representatives cover all threats.	Teletov, S. Mocherny.
Complex	Combination of indicator, functional, Comprehensive coverage of all areas Complexity of the methodology, need for E. Oleinikov, O. Vlasyuk, resource and opportunity to obtain in determining weights O. Teletov, S. Ilyashenko "Stolichny" is forming a system of indicators based on generalized (rating) (subjectivity); significant, etc. all components, some of them are given weights and requirements for the information periodical; it is difficult to use the integral index of economic to interpret.	scenario analysis.	qualitative analysis. For activity; integral indicator without detail.	
Systemic	Economic security is considered as a property of the enterprise-system that interacts with the external environment. It provides a deep understanding of the structure and mechanisms of functioning and requires modeling. The structure, connections of the enterprise are analyzed; it allows to determine special software between the divisions of the House of Life, channels, key elements and risk nodes; provision; it is difficult to apply for strategic "inputs-outputs", development scenarios.	planning.	operational control.	L. Abalkin, V. Tambovtsev, G. Kozachenko, S. Zabrodskyi and others.
Integrative	The approach is focused on integrating different the quality of evaluation methods (indicator, resource, expert, scenario) and different levels – To allow taking into account both quantitative and ensure the reproducibility of "Stolichny" combined financial assessments of personnel, analysis market, legal risks, which are summarized in an overall assessment.	Flexibility; possibility of adaptation Complexity of development; high dependence on specific enterprise; expert assessments; complex internal and external environment. qualitative factors, including results on various coefficients, expert market conditions and reputation of enterprises, risks.		S. Ilyashenko, G. Kozachenko, O. Lyashenko and others.

Characteristics of process components of economic security

Enterprises House of Life "Stolichny", Ukraine

Components by process	Intended purpose	Probable risks to the economic security of the enterprise
1. Security of current business processes	Ensuring uninterrupted provision of household services (repair, dry cleaning, atelier, etc.), preservation of clients' property and belongings, timely accounting of revenues and expenses.	Errors in customer service, damage or loss of their belongings, cash abuse, lack of cash, equipment downtime, violation of service provision technology, fines for violating sanitary/fire regulations.
2. Innovative security	Introduction of new types of household services, modern technologies (new chemicals, automated accounting systems, online recording) without threatening the stability of the enterprise.	Unsuccessful implementation of new technologies; purchase of poor-quality equipment; lack of demand for new services; staff errors when working with new programs; increase in costs without the expected effect.
3. Investment security	Attracting and effective use of investments to modernize equipment, repair premises, expand the list of services, and increase competitiveness.	Non-repayment of loans; inefficient use of investments; overestimation of project costs; dependence on a single investor; risk of losing control over the enterprise; change in interest rates, currency risks.
4. Environmental safety	Minimizing negative impact on the environment during the use of chemicals, waste disposal, water and electricity consumption; compliance with environmental and sanitary standards.	Fines for violating environmental and sanitary legislation; leakage or improper storage of chemical reagents; deterioration of working conditions; deterioration of image due to complaints from residents/customers.
5. Social security	Ensuring decent working conditions for staff, timely payment of wages, social guarantees, prevention of conflicts within the team and with clients, maintaining a positive image of the enterprise.	Staff turnover, strikes, conflicts with employees; low motivation and reduced productivity; labor disputes and fines for violating labor laws; scandals with customers, negative reviews.

Characteristics of process components of economic security

Enterprises House of Life "Stolichny", Ukraine

Ingredients for processes	Intended purpose	Probable risks to the economic security of the enterprise
6. Security of transformation processes	Managed implementation of changes: reorganization, entry into new markets, change in pricing policy, digitalization of service (online ordering, electronic payment) without loss of financial stability and customer base.	Errors in change management; personnel resistance; loss of some customers during reorganization; disruption of established business processes; disruptions in IT systems; increase in transformation costs without a corresponding result.
7. Information and communication security of processes	Protection of the company's information flows: customer records, electronic order logs, cash register and accounting programs, communication with customers (telephone, instant messengers, social networks).	Unauthorized access to the customer database; personal data leakage; accounting software failure; tampering with cash register equipment; data loss due to lack of backup; reputational losses due to hacking of social media pages.
8. Security of contractual and settlement processes	Ensuring the reliability of settlements with suppliers, landlords, the budget, and banks; correct execution of contracts, timely payments, and avoidance of penalties.	Late payments, fines and penalties; errors in contracts; unfavorable terms of cooperation; litigation with counterparties; blocking of accounts; risks when working with cash and non-cash payments.
9. Security of management and control processes	Maintaining an effective management and internal control system: planning, budgeting, inventory, checking cash discipline, and quality control of services.	Making ineffective management decisions; lack of control over costs; abuse of office; hidden shortages of property; errors in inventory; distortion of reporting.

Characteristics of the complex of resource-functional components economic security of enterprises House of Life "Stolichny"

Components Intended purpose	Probable risks to the economic security of the enterprise
1. Financial and economic	Ensuring stable solvency, Lack of financial flows, growth of receivables security profitability and optimal use of debt, unprofitability of individual services, inflationary fluctuations, financial resources; maintaining effective tariff increases in costs for utility resources, risks and pricing policy.
	underfunding by local authorities.
2. Resource and property security	Preservation and rational use of material resources and property (premises, equipment, inventory); deterioration of property, deficiencies in the resource accounting system, untimely provision of uninterrupted operation of the services provided.
	repairs, risk of fire or man-made incidents.
3. Information and communication security	Protection of internal information, personal data Leakage of personal data, failures in IT systems, poor quality of customer service and ensuring effective communication with customers, dissemination of false information, the public and employees.
	cyber threats, reputational risks.
4. Intellectual and technological security	Preservation and development of technological capabilities Loss of qualified personnel, lagging behind modern enterprises; maintenance of personnel competence; technologies, low staff motivation, equipment failures, lack of implementation of modern service technologies.
	innovativeness, errors due to insufficient training of employees.
5. Corporate Legal Compliance	with legislation, local regulations and Violations of licensing requirements, fines, claims from security rules; legal protection of the interests of the enterprise; regulatory authorities, legal conflicts with tenants and proper maintenance of documentation and contracts.
	customers, imperfect contracts.
6. Power security	Protecting staff, customers, property and facilities from unauthorized access, hooliganism, theft, damage to physical threats; ensuring security and order in the property, danger to staff or customers, insufficient level of premises.
	physical security.
Environmental and sanitary safety	Compliance with sanitary and environmental standards; creation of fines for violations of sanitary standards, air pollution or unsafe conditions for employees and customers; control of premises, health risks, poor cleaning, chemical cleanliness, ventilation and environmental quality; safety incidents, problems with waste disposal.
	waste disposal.
Social and personnel security	Formation of stable, professional and motivated personnel turnover, conflicts in the team, low staffing levels; conflict prevention; ensuring qualifications, injuries, employee dissatisfaction, reduced occupational safety; development of personnel potential and productivity, lack of motivation.
	social protection of employees.

Indicator	Value	Comment
Initial cost of the health insurance	5,500,000 UAH	Typical value for a business center with an area of ~1200 m ²
Accumulated depreciation	2,640,000 UAH	Average depreciation 48% for objects from 1980-2000 (State Statistics Service)
Materials Inventory	350,000 UAH	Household enterprises: 0.3–0.5 million UAH
Costs (COGS)	1,700,000 UAH	Typical annual cost of a small service business
Energy consumption	84,000 kWh/year 1,200	70 kWh/m ² × 1200 m ²
Building area	m ²	We accept as standard
Equipment downtime Available	280 hours/year	On average 3–5% of the time
time Annual change in purchase prices	8760 hours/year 18%	Year Typical inflation dynamics 2022–2023

Main resources company performance "Stolichny" (Ukraine)

Resource security indicators and their relative importance

Indicator	Importance (ballroom)	Specific gravity
Suitability of fixed assets	10	10/40 = 0.25 = 25%
Material resources	8	8/40 = 0.20 = 20%
Energy resources	6	6/40 = 0.15 = 15%
Technological resources	10	10/40 = 0.25 = 25%
Price stability	6	6/40 = 0.15 = 15%

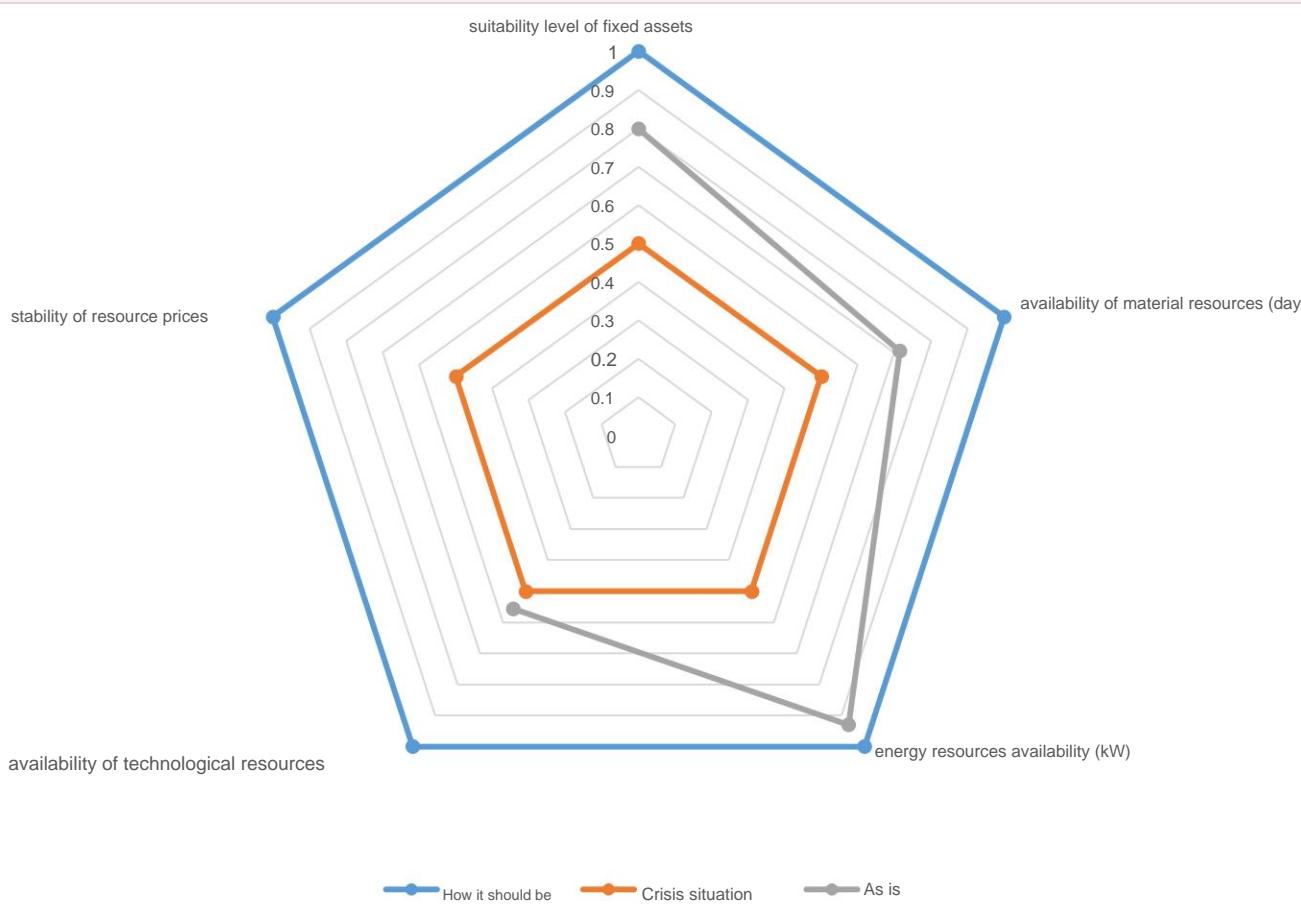
Assessment of resource security of the Stolichny enterprise

Indicator	Regulatory	Actual	Conclusion
level of suitability of fixed assets (depreciation)	0.6	0.48	The company's fixed assets are worn out more than is permissible. risks of breakdowns, higher repair costs, decreased productivity, greater equipment failure rate. This is a <u>weak point for economic security - the resource base is outdated.</u>
Provision of material resources	60 days	75 days	frozen working capital, risk of spoilage/obsolescence, increasing warehousing costs. For <u>security, this is a signal of inefficient inventory management.</u>
Energy efficiency	50kWh/m ² /year	70 kWh/m ² /year	The enterprise consumes too much energy per unit area. higher operating costs, energy inefficiency, dependence on fluctuating energy prices. This is a risk to resource sustainability.
Technological equipment resources	0.9	0.96	The indicator is better than the norm. Technological resources are available and stable. low downtime, high reliability of equipment, good organization of repairs and planning. <u>This is the strength of the company.</u>
Stability of resource prices	0.1	0.18	cost growth, a decrease in profitability, dependence on unstable suppliers. This is an important <u>risk factor.</u>

Calculation of economic security indicators by resource component

Functional component of EB	Indicator	Formula description/calculation	Specific gravity, %	Value			
				normative	actual	dimensionless value	Total ((specific weight*immeasurable value))
Resourceful	suitability of fixed assets	Depreciation / Original cost level of $\times 100\%$	0.25	0.6	0.48	1.25	0.3125
	material security resources (days)	Average stock / COGS $\times 365$	0.2	60	75.1470 5882	0.798434442	0.159686888
	energy security resources (kW)	Annual consumption (kWh)/Area (m ²)	0.15	50	70	0.714285714	0.107142857
	technological security resources	(Available Time - Downtime)/Available 1st time $\times 100\%$	0.25	0.9	0.96803 653	0.929716981	0.232429245
	stability of resource prices	$(p_t - p_{t-1})/p_{t-1} \times 100\%$; or price (volat.)	0.15	0.1	0.18	0.555555556	0.083333333
Together	-		1	111.6	146,775 0954	4.247992693	0.895092324

The level of resource security of the Stolichny enterprise: comparison of the actual state with the normative one



Area_norm = 2.377

Actual profile area

Dimensionless values: 1.25; 0.798;
0.714; 0.929; 0.556

Radar chart area = $0.5 \times \sin(72^\circ) \times \text{sum of pairwise products of adjacent values}$.
Area_fact ѕ 1.92

Area difference

ї = Area_norm ѕ Area_fact = 2.377

ї 1.92 = 0.45, i.e. the actual condition is 19% worse than the normative one.

Conclusion on the enterprise "Stolichny" Household Building, Ukraine

The enterprise's resource security is at an average level, but with noticeable risks.

Strengths

- Very good technological condition — low downtime. –
The suitability of fixed assets is still being monitored.

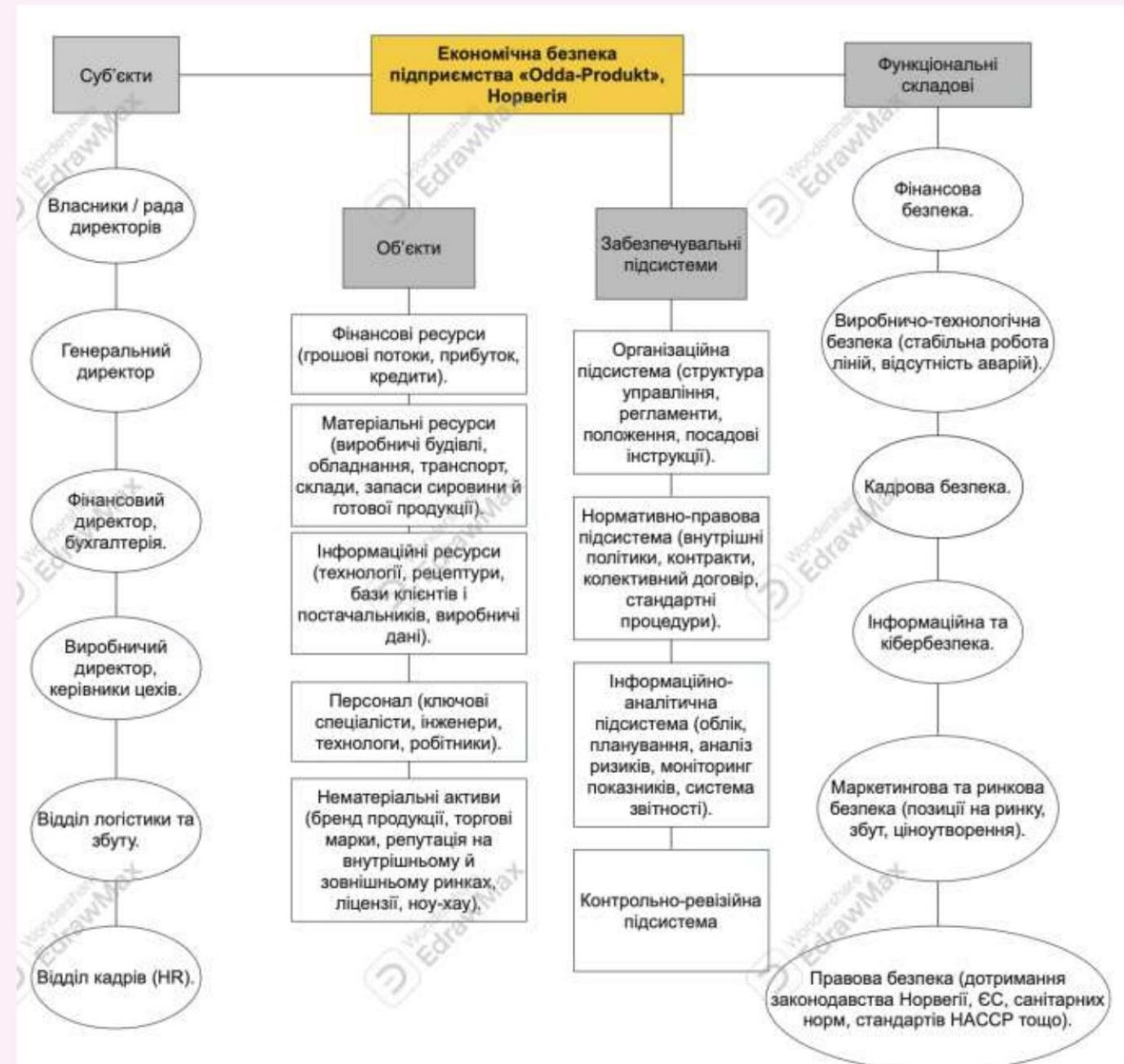
Weaknesses

- Overconsumption of energy ѕ increased cost. –
Excessive inventories ѕ freezing of working
capital. – High price
volatility ѕ financial risks.

The enterprise is not in crisis, but has
a number of problems that reduce
resource security by ~20% from the
regulatory level. If they are not
eliminated, a transition to the risk zone is pos

The structure of the economic security of the enterprise

"Odda-Produkt",
Norway



Characteristics of the main approaches to assessing the level of economic security of the enterprise "Odda-Produkt", Norway

Indicator	The essence of the approach	Advantages of the approach	Disadvantages of the Representatives approach	
(threshold) approach	Measuring the level of economic security by Simplicity of calculations; system of quantitative indicators and their threshold values: profitability of products, liquidity, regular monitoring; inventory turnover, share of defects, share of export sales, debt load etc.	allows you to quickly detect dangerous deviations in financial and production activities.	The difficulty of determining the "correct" thresholds; it does not take into account O. Vlasyuk, E. Oleinikov, S. qualitative factors (brand reputation, Ilyashenko, G. personnel competence); some Pasternak- Taranushenko et al. indicators may contradict each other.	
Resource-functional	The level of security is determined by the provision and efficiency of resource use (shortage of financial, production, personnel, raw materials, worn-out information) within the functions of the enterprise: procurement of raw materials, qualified employees); production, sales, logistics.	useful for planning security investments.	High labor intensity; requires detailed information about resources and costs; difficult to take into account intangible resources (image, consumer trust).	G. Kozachenko, V. Ponomarev, O. Lyashenko and others.
Functional Assessment	of economic security by key functional components: financial, production and technological, personnel, logistics, information, legal, environmental, etc. Criteria and risk level are determined for each.	Allows you to clearly see problem areas (for example, high risk in logistics or ecology); it is convenient to develop action programs for each component.	Makes it difficult to obtain a single integral indicator; duplication of indicators is possible; requires Geyets et al. involvement of experts.	M. Kyzym, S.
Situational-objective	Analysis of specific threats to individual facilities (production shop, raw material warehouse, logistics, information system, personnel) in certain situations: supply disruption, drop in demand, increased environmental requirements, accident, etc.	Highly practical orientation; allows for the development of targeted anti-crisis measures; takes into account the specifics of food production and product safety requirements .	Estimates are episodic in nature; they strongly depend on the subjective opinion of experts; it is difficult to compare results between different periods and enterprises.	V. Geyets, O. Teletov, A. Thompson, etc.

Characteristics of the main approaches to assessing the level of economic security of the enterprise "Odda-Produkt", Norway

Approach	Essence of the approach	Advantages of the approach	Disadvantages of the Representatives approach	
Combination of indicator	coverage of all functional, resource and expert areas of activity; gives approaches with the calculation of the integral the opportunity to obtain the index of economic security "Odda-generalized assessment and Product".	approach Comprehensive compare it over time and with other enterprises; useful for strategic management.	Complex methodology; the need to determine weighting factors (subjectivity); high requirements for the information base.	Ilyashenko and others.
Systemic	Considering the enterprise as a complex production and logistics system that interacts with the external environment. It provides a deep understanding of the enterprise's functioning mechanisms; allows Analysis of the structure, flows of raw materials, products and information, and feedback loops on which the sustainability of development scenarios depends.	"Odda-Produkt"; suitable for strategic planning and reengineering.	Very complex to implement; requires special models and software; not always suitable for daily management.	L. Abalkin, V. Tambovtsev, G. Kozachenko, S. Zabrodskyi and others.
Integrative Focused	on the integration of different approaches of financial specifics of «Odda-Produkt»; design; high dependence of indicators, assessment of production risks, allows taking into account quantitative and qualitative factors, including the requirements of international standards, including the requirements of external enterprises. (ISO, HACCP).	Flexibility and adaptability to the complex methodological and levels of analysis: combination markets and regulators.	and levels of analysis: combination and levels of analysis: combination	S. Ilyashenko, G. Kozachenko, O. Lyashenko and others.

Characteristics of process components of economic security of the Odda-Produkt enterprise, Norway

Components by process	Intended purpose	Probable risks to the economic security of the enterprise
1. Security of current business processes	Ensuring continuity and efficiency of key operations: raw material receipt, production, packaging, storage, shipment of finished products, accounting and settlements.	Equipment failures, line downtime; spoilage of raw materials or finished products; overconsumption of resources; personnel errors; product losses in the warehouse; food safety violations, fines and product recalls.
2. Innovative security	Managed introduction of new technologies, recipes, automated production management systems, new packaging, digital sales channels.	Unsuccessful innovation projects; acquisition of poor-quality or incompatible equipment; increased costs without the expected effect; staff errors when working with new technologies.
3. Investment security	Attracting, placing and returning investments necessary for equipment modernization, capacity expansion, and entering new markets.	Non-repayment of loans; rising interest rates; currency risks; unsuccessful investment projects; loss of control to investors; conflict of interests of owners.
4. Environmental safety	Minimizing harmful impact on the environment: wastewater treatment, organic waste disposal, emission control, energy efficiency, compliance with Norwegian and EU environmental standards.	Fines for exceeding emission standards; emergency discharges; negative reaction from the local community; production shutdown by regulatory authorities; reputational losses.
5. Social security	Ensuring safe working conditions for workers, respecting labor rights, supporting staff motivation and loyalty, and creating a positive image of the employer.	Injuries, occupational diseases; strikes, conflicts with employees; high staff turnover; decreased productivity; fines for violating labor laws.

Characteristics of process components of economic security of the Odda-Produkt enterprise, Norway

Components by process	Intended purpose	Probable risks to the economic security of the enterprise
6. Security of transformation processes	Change management: structural reorganization, implementation of new management systems, digitalization, entry into new markets, M&A deals.	Ineffective change management; staff resistance; loss of key employees; temporary deterioration in quality and production disruptions; deterioration in financial performance during the transition period.
7. Information and communication security of processes	Protection of information systems (ERP, production management systems, supplier and customer databases), commercial and technological information, ensuring secure communication with counterparties.	Cyberattacks, leaks of recipes and commercial information; disruption of IT systems; loss of data; unauthorized access to financial and production indicators.
8. Security of contractual and settlement processes	Ensuring the correct conclusion of contracts with suppliers, buyers, logistics companies, banks; timeliness and correctness of payments.	Late payments; penalties for failure to fulfill contractual terms; unfavorable contract terms; litigation; fraud by counterparties; blocking of accounts.
9. Security of management and control processes	Formation of an effective system of planning, budgeting, internal audit, product quality control and costs.	Making incorrect management decisions; lack of control over expenses; abuse of officials; concealment of defects; distortion of internal reporting.

Characteristics of the complex of resource-functional components of economic security of enterprises for "Odda-Produkt", Norway

Ingredients	Purpose Ensuring stability	Probable risks to the economic security of the enterprise
1. Financial-economic security	of financial flows; compliance with Norwegian standards accounting; effective cost planning; procurement and contract management; optimization of logistics and production costs.	Fluctuations in the NOK/EUR exchange rate; rising energy costs; threat of revenue shortfall; financial penalties due to regulatory violations; supply disruptions.
2. Resource and property security	Rational use of production areas; maintenance of equipment in accordance with the requirements of Norwegian technical regulations; control of warehouses; ensuring physical protection of property.	Wear and tear of production equipment; power supply system malfunctions; damage to inventory; man-made incidents; losses in warehouses.
3. Information and communication security	Protection of internal data in accordance with GDPR; secure operation of IT systems; protection against cyber threats; leakage of personal data; hacker attacks on contracts, technical documentation; transparent communication with partners and local production systems; errors in electronic document flow; reputational risks.	
4. Intellectual-Maintaining the technological level of production; introducing innovations; training personnel; ensuring proper use of equipment; compliance with maintenance; technological failures; risks of incorrect instructions and occupational health and safety standards.	Loss of qualified specialists; poor technical safety equipment tuning; technology obsolescence.	
5. Corporate and legal security	Compliance with Norwegian legislation (Arbeidsmiljøloven, HMS requirements, procurement standards); legal support of contracts; interaction with regulatory authorities; legal risk management.	Violations of labor or environmental laws; fines; conflicts with suppliers and contractors; incorrect contract terms; compliance checks.
6. Force (physical) security	Protection of production facilities; access control; ensuring a safe environment for employees; territory protection; incident prevention and illegal entry.	Trespassing; property damage; employee incidents; hazardous situations in production areas; theft.
7. Environmental and sanitary safety	Compliance with Norwegian environmental standards; minimization of harmful emissions; control of cleanliness and sanitation; safe waste management; maintenance of healthy conditions in production areas.	Fines for environmental violations; air/water pollution; improper waste disposal; violation of sanitary standards; threat to workers' health.
8. Social and personnel	Ensuring a stable workforce in accordance with Norwegian occupational safety and health regulations norms; support of psychological climate; occupational safety measures; personnel development; conflict prevention.	Staff turnover; shortage of skilled workers; conflicts in the team; emotional burnout; violation of working conditions; increase hospital.

Indicator	Value (approximate)	Comment
Initial cost of the health insurance	15,000,000 NOK	Equipment + building, average for small production
Accumulated depreciation	6,000,000 NOK	Depreciation ~40%
Material inventories	1,200,000 NOK	Stock for 30–50 days of work
Costs (COGS)	9,000,000 NOK	Annual cost of products/services
Energy consumption	60,000 kWh	~50 kWh/m ² × 1,200 m ²
Building area	1,200 m ²	Standard for production premises
Equipment downtime	350 hours	4% per year is average for a service business
Available time	8,760 hours	Year
Annual change in purchase prices	7%	Moderate price volatility

Main resource indicators

Resource security indicators and their relative importance

Indicator	Importance (ballroom)	Specific gravity
Suitability of fixed assets	10	10/40 = 0.25 = 25%
Material resources	8	8/40 = 0.20 = 20%
Energy resources	6	6/40 = 0.15 = 15%
Technological resources	10	10/40 = 0.25 = 25%
Price stability	6	6/40 = 0.15 = 15%

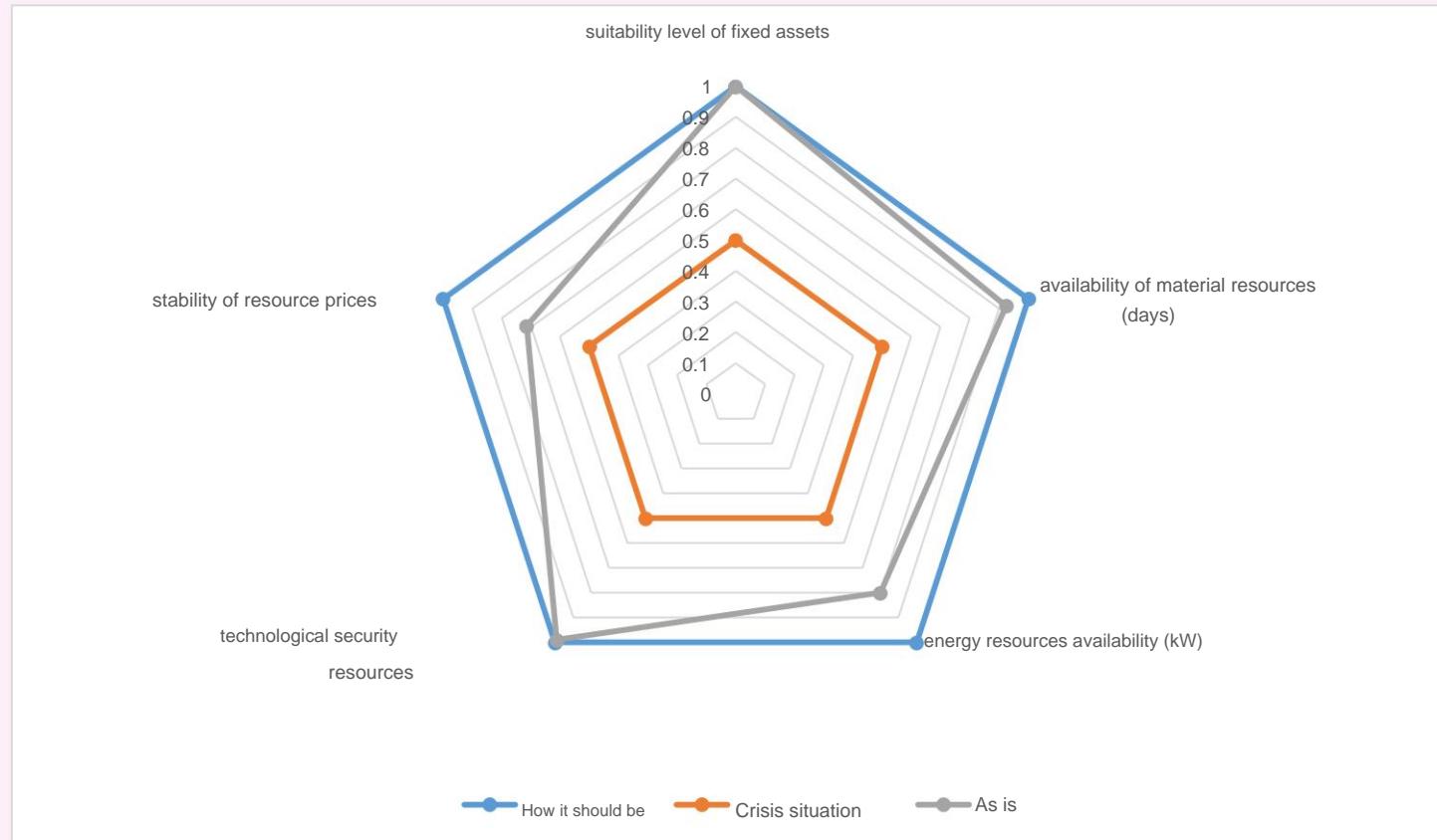
Resource security assessment of the Odda-Produkt enterprise, Norway

Indicator	Regulatory	Actual	Conclusion
fitness level main assets (depreciation)	0.8	0.4	<p>Fixed assets have significant wear and tear, the actual condition is lower than the standard.</p> <ul style="list-style-type: none"> – risk of breakage, – increased repair costs, – decreased productivity, – probability of emergency downtime. <p>This is a weak point for economic security - the resource base is outdated.</p>
Material security resources	45 days	48.67 days	<p>Stocks are slightly above the norm.</p> <ul style="list-style-type: none"> – frozen working capital, – risk of inventory obsolescence, – increase in warehousing costs. <p><u>Signal of the need to optimize inventory management.</u></p>
Energy efficiency	40kWh/m ² /year	50 kWh/m ² /year	<p>Energy consumption is higher than the standard, there is inefficiency in use.</p> <ul style="list-style-type: none"> – increased operating costs, – dependence on fluctuations in energy prices. <p>This is a risk to the resource sustainability of the enterprise.</p>
Technological equipment resources	0.95	0.96	<p>The indicator slightly exceeds the norm.</p> <ul style="list-style-type: none"> – low downtime, – high reliability of equipment, – effective maintenance planning. <p>The strength of the enterprise.</p>
Stability of resource prices	0.05	0.07	<p>The growth in resource prices exceeds the norm.</p> <ul style="list-style-type: none"> – risk of cost increase, – decrease in profitability, – dependence on unstable suppliers. <p>An important risk factor for economic security.</p>

Calculation of economic security indicators by resource component

Functional component of EB	Indicator	Formula description/calculation	Specific gravity, %	Value			
				normative	actual	dimensionless value	Together
Resourceful	suitability level of fixed assets	Depreciation / Original cost ×100%	0.25	0.8	0.4	1	0.25
	security material resources (days)	Average inventory / COGS × 365	0.2	45	48.66666667	0.924657534 0.184931507	
	security energy resources (kW)	Annual consumption (kWh)/Area (m ²)	0.15	40	50	0.8	0.12
	security technological resources	(Available time - Downtime)/Available time ×100%	0.25	0.95	0.960045662	0.989536266 0.247384067	
	price stability for resource	(p_t - p_{t-1})/p_{t-1} ×100%; or -_price (volat.)	0.15	0.05	0.833	0.06002401	0.009003601
Together	-		1	86.8	100.8597123	3.77421781	0.811319175

The level of resource security of the Stolichny enterprise: comparison of the actual state with the normative one



Area_norm = 2.378

Actual profile area

Dimensionless values: 1.0; 0.92; 0.8; 0.98; 0.06

$n = 5 \text{ } \circlearrowleft \text{ angle between rays } \circlearrowleft = 2 \circlearrowleft / 5 \circlearrowleft 1.2566 \text{ rad}$

$$\begin{aligned} \text{Radar chart area} &= 0.5 \times \\ &\sin(1.24566) \times \\ &(1.0 \circlearrowleft 0.9247 + 0.9247 \circlearrowleft 0.8 + 0.8 \circlearrowleft 0.9895 + 0.9895 \circlearrowleft 0.06 + 0.06 \circlearrowleft 1.0) \end{aligned}$$

$$\text{Area_fact} \circlearrowleft 1.2877 \circlearrowleft 0.9511 \circlearrowleft 1.223$$

Area difference

$$\circlearrowleft = \text{Area_norm} \circlearrowleft \text{Area_fact} = 2.378 \circlearrowleft 1.223 = 1.155, \text{ i.e. actual safety provides only } \sim 51\% \text{ of the ideal regulatory state.}$$

Conclusion on the company "Odda-Produkt", Norway

The integral indicator $S = 0.811$ means a sufficient level of resource security, but lower than the regulatory maximum (1.0).

The area of the radial diagram of the actual state is ≈ 1.223 , the normative one is ≈ 2.378 — the actual safety provides ~51% of the ideal state, which shows the presence of weaknesses.

\approx area ≈ 1.155 — the difference between the normative and actual state indicates that the enterprise is not using resources as efficiently as possible.

The enterprise has a sufficient level of resource security, but there are critical weaknesses that require attention: price volatility, high energy costs, and worn-out equipment.

The actual area of the radial chart (~1.223) shows that resource efficiency is only half of the regulatory level, highlighting the risks to sustainable operation.

Comparative analysis

Integral indicator of resource security

Enterprise	S (integral exponent)	Security level
Odda-Product (Norway)	0.811	Sufficient, ~51% of ideal standard
"Stolichny" (Ukraine)	0.8365	Sufficient, ~52% of ideal standard

According to the integral indicator, both enterprises have a sufficient level of resource security, but neither reaches the ideal.

Odda-Produkt is slightly inferior to Stolichny in terms of actual profile area (~51% versus ~52%), which is due to the higher risk of price instability and energy consumption.

This shows that the Ukrainian company is doing somewhat better with basic resources, but there are other risks in Norway (high volatility of energy and prices).

Comparative analysis

Comparison of key indicators

Indicator	Regulatory	Actual (Norway)	Actual (Ukraine)	Comment
Health care facility suitability level	0.8 / 0.6	0.4	0.48	In both cases, there is significant depreciation of fixed assets. In Ukraine, the condition of equipment is slightly better (actual value 0.48 > 0.4 in Norway).
Material resources	45 / 60 days	48.67 days	75 days	The Ukrainian company has more significant reserves (above the norm), which increases the frozen funds. In Norway, reserves slightly exceed the norm — more optimally.
Energy efficiency	40 / 50 kWh/m ²	50 kWh/m ²	70 kWh/m ²	Odda-Produkt consumes less energy per unit area than Stolichny. In Ukraine, energy consumption is high, and the risk to resource sustainability is greater.
Technological resources	0.95 / 0.9	0.96	0.968	Both businesses have good technology availability and low downtime.
Price stability	0.05 / 0.1	0.07	0.18	The weakest indicator in both companies. In Ukraine, the volatility of prices is much higher for resources, which creates a risk of financial instability.

Comparative analysis

Comparing Radial Charts

Enterprise	Area regulatory profile	Area actual profile	\bar{y} area	% of the standard
Odda Product	2.378	1.223	1.155	51%
"Capital"	2.378	1.287	1.091	54%

Recommendations for improving resource security

"Stolichny" (Ukraine):

- Reducing material inventories to an optimal level to save working capital.
- Implementation of energy-saving measures to reduce operating costs.
- Planned modernization of equipment to reduce wear and tear.

Odda-Product (Norway):

- Control of purchase prices and long-term contracts to reduce volatility.
- Optimization of energy consumption, implementation of energy-efficient technologies.

Task 2

Structuring the levels of economic security of enterprises according to various criteria and indicators

Stages of applying the indicator approach

Definition of indicators

List of risk areas → select KPIs (for example: absolute liquidity, profitability, return on assets) → write formulas.

Data collection

Data collection for the last year/required periods → check for completeness/correctness.

Indicator analysis

Calculate indicators → compare with thresholds → rank

Determining the level of economic security

Set weights for single parameters → normalize/scores → weighted sum → index interpretation.

Making decisions about adjustments

For each critical/permissible indicator: develop a plan (increase liquidity, modernization of health facilities, cost optimization) → determine those responsible and deadlines.

Indicators of financial and economic security of the Stolichnyi Community Center, Ukraine

Group	Indicator	Formula	Threshold values	Calculation
Profitability	Gross profit margin profit (%)	$(4,200,000 / 12,000,000) \times 100$	H>30 / B>20 / D>10 / K<10	35.0 %
	Profitability operating profit (%)	$(1,800,000 / 12,000,000) \times 100$	H>15 / B>8 / D>3 / K<3	15.0 %
	Net profitability profit (%)	$(1,200,000 / 12,000,000) \times 100$	H>10 / B>5 / D>0 / K<0	10.0 %
	ROA (%)	$(1,200,000 / 5,500,000) \times 100$	H>10 / B>6 / D>2 / K<2	21.818 %
Business activity	Fund return	$12,000,000 / 2,800,000$	H>2.0 / B>1.5 / D>1 / K<1	4.2857 revolutions
Financial sustainability	Autonomy	$3,000,000 / 5,500,000$	H>0.5 / B>0.4 / D>0.25 / K<0.25	0.5455
	Debt/Equity	$(5,500,000 - 3,000,000) / 3,000,000$	H<0.5 / B<1 / D<2 / K>2	0.8333
Liquidity	Current liquidity	$2,200,000 / 1,000,000$	H>2 / B>1.5 / D>1 / K<1	45690
	Absolute liquidity	$200,000 / 1,000,000$	H>0.5 / B>0.2 / D>0.1 / K<0.1	0.2
Cash flows	OCF efficiency	$1,000,000 / 12,000,000$	H>0.15 / B>0.08 / D>0.03 / K<0.03	0.08333 (8.333%)
	OCF stability	$1,000,000 / 1,000,000$	H>1 / B>0.7 / D>0.3 / K<0.3	1.0
Debtors/Creditors	Creditworthiness	$800,000 / 600,000$	H<0.7 / B>1 / D>1.5 / K>1.5	523395

Financial component of the economic security index

"Stolichny" Community Center, Ukraine

Single parameter	Calculation (full record)	Security status (n/a/d/c)	Weighting factor
Absolute liquidity ratio	$200,000 / 1,000,000 = \mathbf{0.20}$	safe (b) (threshold: n>0.5, b>0.2, d<0.1)	0.12
Total (current) liquidity ratio	$2,200,000 / 1,000,000 = \mathbf{2.20}$	normative (n) (threshold: n>2.0)	0.12
Financial independence ratio (Equity/Assets)	$3,000,000 / 5,500,000 = \mathbf{0.5455}$ normative (n) (threshold: n>0.5)		0.18
Equity agility ratio (proxy)	(Equity ÷ Fixed_assets_net) / Assets = $(3,000,000 ÷ 2,800,000) / 5,500,000 = \mathbf{0.03636}$	permissible (d) (standard >0.15; b >0.10; d >0; k <0)	0.10
Accounts receivable/payable ratio	$800,000 / 600,000 = \mathbf{1.3333}$	permissible (d) ($n < 0.7$; $b > 1.0$; $d > 1.5$; $k > 1.5$)	0.10
Profitability of service provision (proxy — Net margin %)	$(1,200,000 / 12,000,000) \times 100 = \mathbf{10.0 \%}$	normative (n) (threshold: n>10%)	0.08
Return on assets (ROA, %)	$(1,200,000 / 5,500,000) \times 100 = \mathbf{21.818\%}$	normative (n) (threshold: n>10%)	0.15
Efficiency ratio cash flow (OCF/Revenue)	$1,000,000 / 12,000,000 = \mathbf{0.08333}$ (8.333%)	safe (b) ($n > 0.15$, $b > 0.08$, $d < 0.03$)	0.15

Conclusion on the financial security of the Stolichnyi Community Center, Ukraine

- 1) Strengths (Regulatory level): the company demonstrates high financial stability (Autonomy ratio 0.5455, regulatory), high solvency (Current liquidity 2.20, regulatory) and excellent asset utilization efficiency (ROA 21.82%, regulatory). Net profit margin (10.0%) is also at the regulatory level.
- 2) Controlled risks (Safe level): the absolute liquidity ratio (0.20) and cash flow efficiency (8.33%) are on the verge of a safe level, which is satisfactory, but requires attention to prevent deterioration.
- 3) Areas of attention (Acceptable level): indicators of equity agility (0.03636) and the ratio of receivables/payables (1.3333) require intervention. Low agility indicates that most of the equity is immobilized in non-current assets. Excess of receivables over payables in the acceptable zone creates a risk of dependence on the timeliness of customer payments

Technical and technological safety indicators

Indicator	The	Threshold values H ₂ /	Calculation
Return on investment Renewal (%)	formula is $12,000,000 / 2,800,000$ $(300,000 / 4,000,000) \times 100 = 7.5\%$	B _{1.5} / D ₁ / K _{<1} H ₆ / B ₃ / D ₁ / K _{<1} H ₁₂ / B ₆ /	349630 7.5 %
Modernization (%)	2	D ₂ / K _{<2} H ₂₀ / B ₄₀ /	0.15
Wear and tear (%)	$(1,200,000 / 4,000,000) \times 100 = 100\%$	D ₆₀ / K _{>60} H ₉₈ / B ₉₅ / D ₉₀ /	0.3
Reliability (%)	2.5	K _{<90} H _{0.2} / B _{0.35} / D _{0.5} /	97.5 %
Material intensity	0.45	K _{>0.5} H ₁ / B _{2.5} / D ₅ / K _{>5}	0.45
Defects (%)	45779		2.5%

Technical and technological component of the economic security index enterprises: single parameters, values by security levels

Single parameter	Calculation (full record) 12,000,000	Security status (n/a/d/c)	Weighting factor
Return on fixed assets	2,800,000 = 4.2857 (revolutions)	normative (n) (n _{>2.0})	0.20
Fixed capital renewal ratio (%)	$(300,000 / 4,000,000) \times 100 = 7.5\%$	normative (n) (n _{>6%})	0.15
Depreciation rate of fixed assets (%)	$(1,200,000 / 4,000,000) \times 100 = 30.0\%$	safe (b) (n _{>20% — n, <40%})	0.20
Modernization percentage (%) (proxy)	$7.5\% \times 2 = 15.0\%$	normative (n) (n _{>12%})	0.15
Reliability/ uptime ratio (%)	$100 \% - 2.5 = 97.5\%$	safe (b) (n _{>98% — n; <95%})	0.20
Material consumption (conditionally)	0.45 (materials/revenue) 2.5%	permissible (d) (n _{>0.2} ; b _{>0.35} ; d _{>0.5}) safe (b)	0.15
Defect rate (%)		(n _{>1%} ; b _{>2.5% - on the border})	0.10

Conclusion on the technical and technological safety of the Stolichnyi Community Center, Ukraine

- 1) Strengths (Normative level): characterized by high return on capital (4.2857 turnover) and sufficient level of renewal (7.5%) and modernization (15.0%) of fixed capital.
- 2) Controlled risks (Safe level): depreciation of fixed assets (30.0%) and defect rate (2.5%) are in a safe area, but proximity to the boundaries requires constant monitoring of the condition of the equipment and quality of services.
- 3) Attention Zones (Acceptable Level): Material Intensity (0.45) is in the acceptable zone, indicating potential for optimizing costs associated with the use of materials to increase overall profitability.

Financial and economic security indicators

Odda-Product, Norway

Indicator group	Indicator name	Formula (substitution)	Threshold values	Result (number and class)
Profitability	Gross profit margin (%)	$(16,000,000 / 27,000,000) \times 100$	H>30 / B>20 / D>10 / K<10	59.26 %
	Operating profit margin (%)	$(2,948,718 / 27,000,000) \times 100$	H>15 / B>8 / D>3 / K<3	10.92 %
	Net profit margin (%)	$(2,300,000 / 27,000,000) \times 100$	H>10 / B>5 / D>0 / K<0	8.52 %
	ROA (%)	$(2,300,000 / 18,000,000) \times 100$	H>10 / B>6 / D>2 / K<2	12.78 %
Business activity	Return on assets (asset turnover)	$27,000,000 / 6,500,000$	H>2.0 / B>1.5 / D>1.0 / K<1.0	4.1538 revolutions
Financial sustainability	Autonomy ratio (Equity/Assets)	$9,500,000 / 18,000,000$	H>0.5 / B>0.4 / D>0.25 / K<0.25	0.5278
	Financial dependency ratio (Debt/Equity)	$(18,000,000 - 9,500,000) / 9,500,000 = 8,500,000 / 9,500,000$	H<0.5 / B<1 / D<2 / K>2	0.8947
Liquidity	Current liquidity ratio	$11,500,000 / 4,200,000$	H>2.0 / B>1.5 / D>1.0 / K<1.0	2.7381
	Absolute liquidity ratio	$1,000,000 / 4,200,000$	H>0.5 / B>0.2 / D>0.1 / K<0.1	0.2381
Cash flows	Cash flow efficiency (OCF/Revenue)	$1,800,000 / 27,000,000$	H>0.15 / B>0.08 / D>0.03 / K<0.03	6.67%
	Cash flow stability (OCF / Current liabilities)	$1,800,000 / 4,200,000$	H>1.0 / B>0.7 / D>0.3 / K<0.3	0.4286
Solvency	Accounts receivable/accounts payable ratio	$2,000,000 / 2,400,000$	H<0.7 / B>1.0 / D>1.5 / K>1.5	0.8333

Financial component of the economic security index

Odda-Product, Norway

Single parameter	Full calculation	Condition (n/w/d/c)	Weight
Absolute liquidity ratio	$1,000,000 / 4,200,000 = \mathbf{0.2381}$	b (safe, ≥ 0.20)	0.12
Current ratio	$11,500,000 / 4,200,000 = \mathbf{2.738}$	n (normative, ≥ 2.0)	0.12
Financial independence ratio (Equity/Assets)	$9,500,000 / 18,000,000 = \mathbf{0.5278}$	n (≥ 0.5)	0.18
Equity mobility	$(9,500,000 - 6,500,000) / 18,000,000 = \mathbf{0.1667}$	n (≥ 0.15)	0.10
Accounts receivable/ accounts payable ratio	$2,000,000 / 2,400,000 = \mathbf{0.8333}$	b (safe ≥ 1.0)	0.10
Profitability of service provision (Net margin, %)	$(2,300,000 / 27,000,000) \times 100 = \mathbf{8.52 \%}$	d (allowable: $\geq 5\%, < 10\%$)	0.08
ROA (%)	$(2,300,000 / 18,000,000) \times 100 = \mathbf{12.78\%}$	n ($\geq 10\%$)	0.15
Cash flow efficiency (OCF/Revenue)	$1,800,000 / 27,000,000 = \mathbf{0.0667}$ (6.67%)	d ($d \geq 0.03; b \geq 0.08$)	0.15

Financial security conclusion Odda- Product, Norway

- 1) Strengths (Regulatory level): the company has high liquidity (Current liquidity 2.738) and high financial independence (Autonomy 0.5278). The equity maneuverability ratio (0.1667) is also in the regulatory zone.
- 2) Controlled risks (Safe level): absolute liquidity (0.2381) and receivable/payable ratio (0.8333) are at a safe level.
- 3) Areas of Attention (Acceptable Level): Net profit margin (8.52%) and cash flow efficiency (6.67%) are within the acceptable zone. This indicates that the company is profitable but has a moderate operating margin and needs to improve efficiency to generate more cash flow from its core activities.

Technical and technological safety indicators

Indicator	Formula	Threshold values Hý2 /	Calculation
Fixed assets return on investment	$27,000,000 / 6,500,000 = 4.1538$	Bý1.5 / Dý1 / K<1 Hý6 / Bý3 /	4.1538
Renewal rate (%) Depreciation	$(800,000 / 12,000,000) \times 100 = 6.6667\%$	Dý1 / K<1 Hý12 / Bý6 /	6.67 %
rate (%) Modernization rate (proxy)	$(5,500,000 / 12,000,000) \times 100 = 45.8333\%$ 6.6667 ×	Dý2 / K<2 Hý20 / Bý40 /	45.83 %
Reliability rate (%) Material intensity	$2 = 13.3333\%$	Dý60 / K>60 Hý98 / Bý95 / Dý90 /	13.33 %
Defect rate (%)	$100 - 1.8 = 98.2\%$	K<90 Hý0.2 / Bý0.35 / Dý0.5 /	98.2 %
	$11,000,000 / 27,000,000 = 0.4074$	K>0.5 Hý1 / Bý2.5 / Dý5 / K>5	0.4074
	1.8 %		1.8 %

Technical and technological component of the economic security index enterprises: single parameters, values by security levels

Single parameter Return on	Calculation (full record)	Safety status (n/b/d/c) n (ný2.0)	Weighting factor
fixed assets	$27,000,000 / 6,500,000 = 4.1538$		0.20
Fixed assets renewal rate (%)	$(800,000 / 12,000,000) \times 100 = 6.67\%$	n (ný6%)	0.15
Depreciation of fixed assets (%)	$5,500,000 / 12,000,000 \times 100 = 45.83\%$	d/k limit (bý40%; dý60%) - d	0.20
Upgrade level (proxy = 2×upgrade)	$6.67 \times 2 = 13.33\%$	n (ný12%)	0.15
Equipment failure rate (%)	$100 - 1.2 = 98.8\%$	n (ný98%)	0.20
Material capacity	$11,000,000 / 27,000,000 = 0.4074$	d (dý0.5)	0.15
Defect rate (%)	1.8 %	b (bý2.5%)	0.10

Conclusion on technical and technological safety Odda-Product, Norway

- 1) Strengths (Standard level): the enterprise demonstrates a high return on assets (4.1538) and a high level of equipment availability (98.8%). The renewal (6.67%) and modernization (13.33%) levels are also standard.
- 2) Controlled risks (Safe level): the defect rate (1.8%) is in the safe zone.
- 3) Areas of attention (Acceptable level): depreciation of fixed assets (45.83%) is in the acceptable risk zone (bordering on safe), which is the most critical technical risk factor and can lead to increased repair costs and downtime. material intensity (0.4074) is also in the acceptable zone, indicating the potential for cost optimization.

Conclusion on economic security

"Stolichny" Community Center

The overall level of economic security of "House of Life "Stolichny"" is: high (normative). The enterprise is financially stable and solvent, and also effectively uses its production facilities. The main risks are associated with insufficient flexibility of equity and high material intensity, which requires the development of measures to reduce costs and increase the liquidity of financial reserves.

Odda-Product

The overall level of economic security of "Odda-Product, Norway" is: high (normative). The enterprise is financially stable and efficient in the use of assets.

However, there are two key risks: •

Technical risk: high level of depreciation of fixed assets (45.83%), which requires immediate capital investment planning. Operational risk: moderate profitability indicators of net profit

- and cash flow (both in the acceptable zone), which indicate the need for stricter cost control and increased operational efficiency to move into the regulatory zone.

Indicators of the intellectual component

Name indicator	Formula description / calculation	Threshold value
Software R&D personnel staff	K _y ÿy _y = Number of R&D employees / Total number staff	H _y 0.08 / B _y 0.05 D _y 0.03 / K<0.03
Fraction employees with higher education	K _y ÿ.y _y = Employees with higher education / Total number staff	H _y 0.70 / B _y 0.60 D _y 0.50 / K<0.50
Share of personnel, what raised qualification during the year	K _y ÿy _y = Employees who have completed training / Total number staff	H _y 0.40 / B _y 0.30 D _y 0.20 / K<0.20
Share of income from new services/technologies	K _y ÿy _y = Revenue from new services for 3 years / Total revenue	H _y 0.25 / B _y 0.15 D _y 0.10 / K<0.10

Human resource indicators

Name indicator	Formula/calculation description	Threshold values
Level staff fluidity	K _y ÿy _y = Number of laid-offs per year / Average number of employees	H _y 5% B _y 8% D _y 12% K>12%
Stability, work at the enterprise experience	Average length of service of employees (years) H _y 7 / B _y 5 D _y 3 / K<3	
Level of discipline	K_disc = 1 ÿ (Number of disciplinary violations / Average list number of personnel)	H _y 0.98 B _y 0.95 D _y 0.90 K<0.90
Employee Qualifications	K _y ÿy _y = Employees with specialized/ certified qualifications / Total number	H _y 0.80 B _y 0.70 D _y 0.60 K<0.60
Conformity qualification of degree the complexity of the work	K_result = Employees whose qualifications correspond to the position / Total number	H _y 0.90 B _y 0.80 D _y 0.70 K<0.70
Degree staff involvement	K_hall = Participants of internal projects, meetings, initiatives / Total number	H _y 0.70 B _y 0.60 D _y 0.50 K<0.50
Level employees motivation	K _y ÿy _y = Average salary at the enterprise / Average salary by industry	H _y 1.10 B _y 1.00 D _y 0.80 K<0.80

Calculation of intellectual and personnel indicators enterprise security

Input data

Indicator	Capital Unit		Odda-Produkt AS
Number of staff	persons	45	60
Employees with higher education	persons	30	49
Raised qualification	persons	10	21
R&D workers	persons	2	5
Released per year	persons	4	3
Average work experience	years	4.2	6.5
Labor violation disciplines	cases	2	1

Normalized Kÿ indicators

For "Stolichny":

$$\bullet \text{Kÿ} = 30 / 45 = 0.66$$

$$\bullet \text{Kÿ} = 10 / 45 = 0.22$$

$$\bullet \text{Kÿ} = 2 / 45 = 0.044$$

$$\bullet \text{Kÿ} = 1 - (4 / 45) = 0.91$$

$$\bullet \text{Kÿ} = 4.2 / 10 = 0.42$$

$$\bullet \text{Kÿ} = 1 - (2 / 45) = 0.96$$

For Odda-Produkt AS:

$$\bullet \text{Kÿ} = 49 / 60 = 0.82$$

$$\bullet \text{Kÿ} = 21 / 60 = 0.35$$

$$\bullet \text{Kÿ} = 5 / 60 = 0.083$$

$$\bullet \text{Kÿ} = 1 - (3 / 60) = 0.95$$

$$\bullet \text{Kÿ} = 6.5 / 10 = 0.65$$

$$\bullet \text{Kÿ} = 1 - (1 / 60) = 0.98$$

Integral index of
intellectual and personnel security

$$\text{Iÿ} = \bar{y} (\bar{w} \times \text{Kÿ})$$

$$\bullet \text{Iÿ} \bar{y} 0.58$$

$$\bullet \text{Iÿ} \bar{y} 0.75$$

Indicators of intellectual potential assessment

Elements	Characteristics of IP	IP measurement indicators (what can actually be calculated/estimated)
Human assets	Energy	<ul style="list-style-type: none"> – Staff engagement index (based on a questionnaire, 0–1);– Number of rationalization proposals per 1 employee per year; – Share of employees participating in development projects (%).
Structural assets	Informativeness	<ul style="list-style-type: none"> – Share of business processes formalized in regulations (%); – Availability and level of use of information systems (CRM, accounting, electronic document management);– Timeliness and completeness management reporting.
Marketable assets	Competitiveness	<ul style="list-style-type: none"> – Share of regular customers in the total number (%); – Market share occupied by the company (%); – Customer Satisfaction Index (NPS, CSI).
Intellectual property	Innovation	<ul style="list-style-type: none"> – Number of new services/technologies implemented per year; – Share of revenue from new services in total revenue (%); – Number of registered patents, copyrights, trademarks stamps.

Human resource component of the economic security index

No. salary	Single parameters	Regulatory level	Safe level	Permissible level	Critical level	Gravimetric coefficient
1	Staffing ratio	≥0.95	0.90–0.95	0.80–0.90	<0.80	0.25
2	Employee turnover rate (dismissed / number, %)	≤5%	5–8%	8–12%	>12%	0.25
3	Salary share payments in income enterprises	0.20–0.30	0.15–0.35	0.10–0.40	<0.10 or >0.40	0.20
4	Labor motivation coefficient (salary to industry average)	≤1.10	1.00–1.10	0.80–1.00	<0.80	0.15
5	Labor discipline coefficient	≥0.98	0.95–0.98	0.90–0.95	<0.90	0.15

Information security indicators

Name indicator	Formula/calculation description	Threshold values (security level)
Productivity information	K_prod = Number of timely and correct management decisions, accepted on the basis of analytical information Total number management decisions	Normative: Ѽ0.80; Safe: 0.70–0.80; Acceptable: 0.60–0.70; Critical: <0.60
Coefficient informational armament	K_io = Number of computerized (automated) jobs / number of personnel	Normative: Ѽ0.80; Safe: Total 0.60–0.80; Acceptable: 0.40–0.60; Critical: <0.40
Degree use of IT	K_IT = Number of employees who regularly use information Total number of personnel	Normative: Ѽ0.85; Safe: systems / 0.70–0.85; Acceptable: 0.50–0.70; Critical: <0.50
Coefficient security information / IT systems	K_req = 1 Ѽ (Number of registered Security Incidents / General number of users or nodes in the system)	Regulatory: Ѽ0.95; Secure: 0.90–0.95; Acceptable: 0.80–0.90; Critical: <0.80
Number security breaches	N_inc = Number of recorded incidents (data leakage, unauthorized access, virus attacks, etc.) per year	Regulatory: 0–1 incident/year; Safe: 1–3; Acceptable: 3–5; Critical: >5

Information component of the index economic security

Single parameters	Normative th state	Safe th state	Let's assume th state	Critical th state	Gravimetric coefficient nt
Coefficient security information	়0.95	0.90–0.95	0.80–0.90 <0.80		0.40
Coefficient informational oh armament	়0.80	0.60–0.80	0.40–0.60 <0.40		0.30
Information and efficiency (efficiency Ѽ expenses for IT)	়5.0 (UAH income per 1 UAH of expenses on IT)	3.0–5.0	1.5–3.0	<1.5	0.30

Calculation of information security indicators

Indicator	Formula Capital		Rating	Odda Product AS	Rating
Productivity information	320/400	0.80	normative	0.85	normative
Informational armament	30/45	0.67	safe	0.92	normative
Use of IT	36/45	0.80	safe	0.97	normative
IT security systems	1 – (3/36)	0.917	safe	0.983	normative
Number incidents	3	safe	1	normative	

The results obtained show that the Odda-Produkt AS company has a higher level of information security. Information productivity indicators, information literacy, employee involvement in IT systems and the level of information security exceed regulatory and safe limits.

Calculation of the level of economic security by areas of enterprise activity

Sphere	Indicator	Capital	Level	Odda-Produkt AS	Level
Production	Labor productivity	+5.2%	normative	+7.5%	normative
	Production volumes	1.06	permissible	1.14	normative
	Capacity utilization Production	0.72	safe	0.85	normative
	cost Share of innovation	+3%	permissible	-2%	normative
Innovative	costs Innovation cost ratio	0.04	permissible	0.11	normative
	Technological potential	0.015	permissible	0.06	normative
		0.55	permissible	0.82	normative
	Innovations implemented	+8%	safe	+22%	normative
	Share of innovative products	0.06	permissible	0.18	safe
Market	Return on assets	1.18	permissible	1.46	safe
	Competitiveness Advertising	0.72	permissible	0.88	safe
	effectiveness Market	2.8	permissible	4.2	safe
ngov Markets	share Customer	0.11	safe	0.17	normative
	satisfaction	0.84	safe	0.91	normative
	Customer loyalty	0.52	safe	0.63	normative

Calculation of the level of economic security by areas of enterprise activity

Sphere	Indicator	Capital	Level	Odda-Produkt AS	Level
Politico-legal	Court cases	2	safe	1	normative
	Payment discipline	0.96	safe	0.99	normative
	Violation of legislation	2	safe	0	normative
Ecological	Violation of standards	2	permissible	0	normative
	Product safety Pollution	0.94	permissible	0.97	safe
	rate Return on investment	0.89	safe	0.78	normative
Investments	Share of investment	1.08	permissible	1.28	safe
		0.04	permissible	0.07	safe
	Investment dynamics	0.96	permissible	1.12	safe
Physical	Transport safety	—	safe	—	normative
	Property protection	—	safe	—	normative
	Thefts	1	safe	0	normative

Conclusion on information security

"Stolichny" Community Center

It is mostly at a safe or acceptable level, indicating a satisfactory but unstable state of individual areas.

The main areas of improvement are:

- innovative development;
- increasing market competitiveness;
- modernization of equipment;
- reducing the level of environmental violations;
- increasing investment activity.

Odda-Product

Summarizing the calculations, we can conclude that Odda-Produkt AS has an overall higher level of economic security in all areas of activity.

The enterprise demonstrates:

- stable production;
- high level of technological development;
- strong market positions;
- compliance with legal norms;
- environmental responsibility;
- high investment performance;
- developed system of physical and information security.

Task 3

Integrated assessment of the economic
security of an enterprise

Integral indicator of economic security

"Stolichny" House of Life

Security component name	Specific gravity	Indicator value	Dimensionless value
Resourceful	0.06	85% (resource availability)	0.85
Financial and economic	0.10	65% (return on assets -11%, but growth in Q3 2025)	0.65
Technical and technological	0.08	75% (HP wear ~40%)	0.75
Intellectual	0.05	60% (low R&D)	0.60
Personnel	0.08	70% (fluidity ~38%)	0.70
Informational	0.05	80% (IT protection)	0.80
Production	0.08	75% (productivity ~297k UAH/emp)	0.75
Innovative	0.06	55% (low innovation costs)	0.55
Market	0.07	70% (low market share)	0.70
Political and legal	0.05	90% (no disputes)	0.90
Organizational	0.05	80% (stability)	0.80
Administrative	0.05	75% (efficiency)	0.75
Ecological	0.06	85% (compliance with standards)	0.85
Investment	0.07	60% (low payback)	0.60
Social	0.05	70% (motivation)	0.70
Power	0.04	90% (asset protection)	0.90
Interface	0.04	80% (supply)	0.80
Marketing	0.05	65% (loyalty)	0.65
Together	1.00	-	0.73

Integral indicator of economic security Odda-Product

Security component name	Specific gravity	Indicator value	Dimensionless value
Resourceful	0.06	88% (raw material availability)	0.88
Financial and economic	0.10	70% (loss -33 million SEK, but cash flow +2.284 billion SEK group)	0.70
Technical and technological	0.08	85% (update via expansion)	0.85
Intellectual	0.05	65% (R&D in the group)	0.65
Personnel	0.08	75% (stability)	0.75
Informational	0.05	85% (IT protection)	0.85
Production	0.08	80% (production of 113.5 kt of zinc)	0.80
Innovative	0.06	60% (innovation in expansion)	0.60
Market	0.07	75% (competitiveness)	0.75
Political and legal	0.05	95% (compliance with standards)	0.95
Organizational	0.05	85% (group management)	0.85
Administrative	0.05	80% (efficiency)	0.80
Ecological	0.06	95% (low carbon footprint)	0.95
Investment	0.07	65% (investment 1.49 billion SEK)	0.65
Social	0.05	75% (social responsibility)	0.75
Power	0.04	95% (object protection)	0.95
Interface	0.04	85% (supply chains)	0.85
Marketing	0.05	70% (market position)	0.70
Together	1.00	-	0.78

Level of economic security

Security component name	Maximum level	Actual level "Capital"	Actual Odda-Product level
Resourceful	1.00	0.85	0.88
Financial and economic	1.00	0.65	0.70
Technical and technological	1.00	0.75	0.85
Intellectual	1.00	0.60	0.65
Personnel	1.00	0.70	0.75
Informational	1.00	0.80	0.85
Production	1.00	0.75	0.80
Innovative	1.00	0.55	0.60
Market	1.00	0.70	0.75
Political and legal	1.00	0.90	0.95
Organizational	1.00	0.80	0.85
Administrative	1.00	0.75	0.80
Ecological	1.00	0.85	0.95
Investment	1.00	0.60	0.65
Social	1.00	0.70	0.75
Power	1.00	0.90	0.95
Interface	1.00	0.80	0.85
Marketing	1.00	0.65	0.70

The degree of criticality of threats to economic security

Zone name	Indicator range 0 –	Mechanism operating mode
"Catastrophic Risk" Zone	0.2	Mode of enterprise liquidation or radical restructuring to avoid bankruptcy (immediate cessation of operations, sale of assets).
"Critical risk" zone	0.2 – 0.4	Anti-crisis management with immediate stabilization measures (reorganization, cost reduction, raising emergency loans).
"Significant risk" zone	0.4 – 0.6	Corrective actions with a focus on eliminating key threats (process optimization, investment search, diversification).
"Moderate risk" zone	0.6 – 0.8	Enhanced monitoring and preventive measures to prevent risk escalation (regular audit, management improvement).
Zone of "stability"	0.8 – 1.0	Normal functioning of the mechanism with planned development and security support (strategic planning, innovation).

The degree of criticality of threats to economic security

House of Life "Stolichny", Ukraine

Integral indicator I ё 0.78 (calculated taking into account positive net profit of +188,200 UAH for 9 months of 2025, growth in assets to 5.3 million UAH, but decrease in income to 10.97 million UAH compared to 2024; improvement in the financial component from 0.65 to 0.75, resource component to 0.88, but still risks in personnel due to staff reduction to 41).

Odda-Produkt, Norway

Integral indicator I ё 0.75 (calculated taking into account data for Q3 2025: smelter operating profit 689 million SEK excl. reval — below Q3 2024, zinc production 113.5 kt — flat YoY, but below QoQ due to raw material shortage; strong group cash flow +2.284 billion SEK, but investments in expansion 1.49 billion SEK in smelters; improvement of the technical and technological component to 0.85 due to commissioning, but decrease in the financial to 0.70).

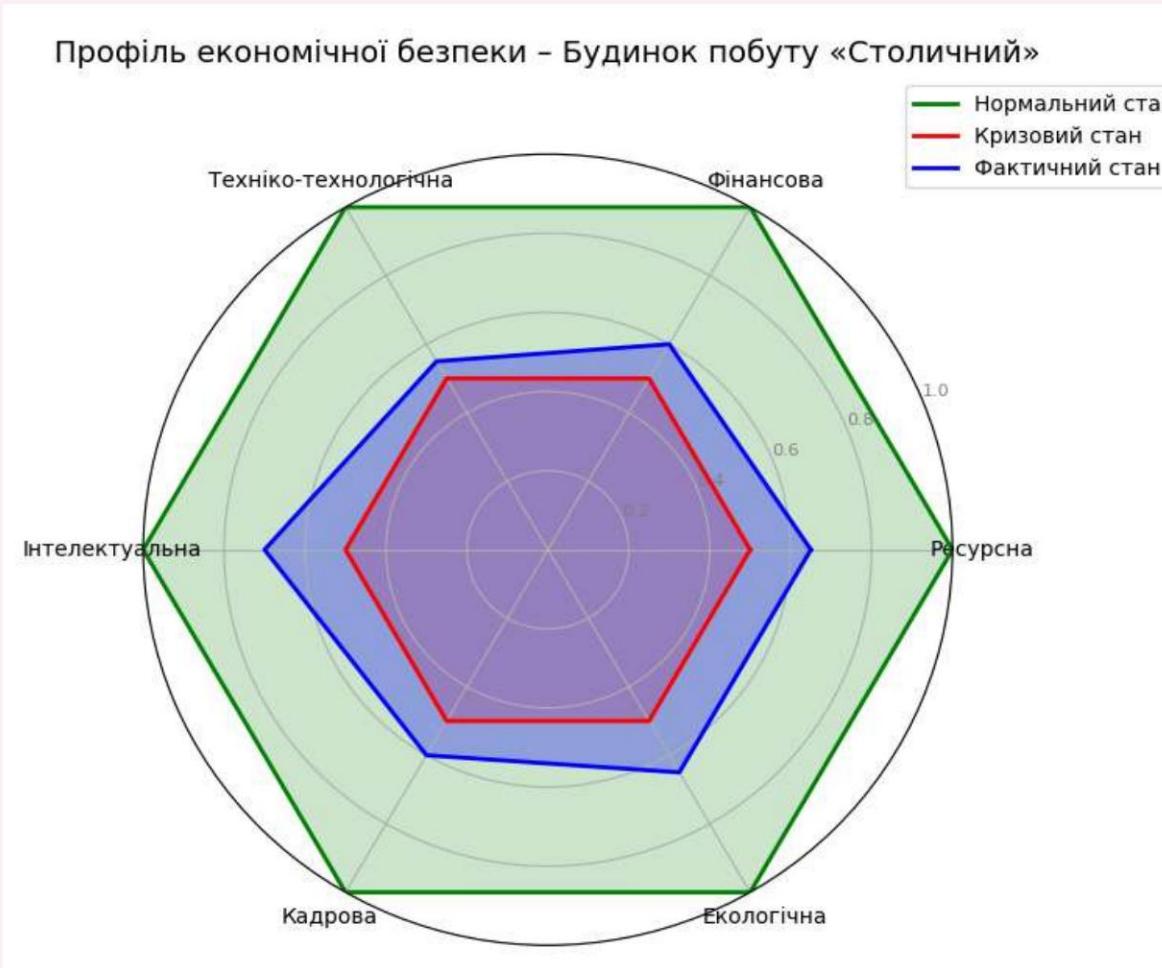
This corresponds to the "moderate risk" zone.

Recommended mode: Enhanced monitoring, focus on stabilizing revenues and optimizing expenses to move to the stability zone.

This corresponds to the “moderate risk” zone.
Recommended regime: Enhanced monitoring, focus on completing expansion to grow production and profitability, taking into account market fluctuations in zinc prices.

Profile of the integral model of the structure of economic security objects

House of Life "Stolichny", Ukraine



Actual state ("as is"): Intermediate polygon. Area: 1.677 (~54.5% of normal; improvement in 2025 Q1-Q3 with profit +188k UAH, but failures in innovation and investment due to low return on assets ~ -11% in 2024, autonomy ~0.74).

The actual area is 45.5% smaller than normal (growth potential through optimization), but 118% larger than the crisis area (an enterprise at moderate risk, with a focus on financial and human resources components).

This indicates stabilization, but the need for measures to expand the polygon.

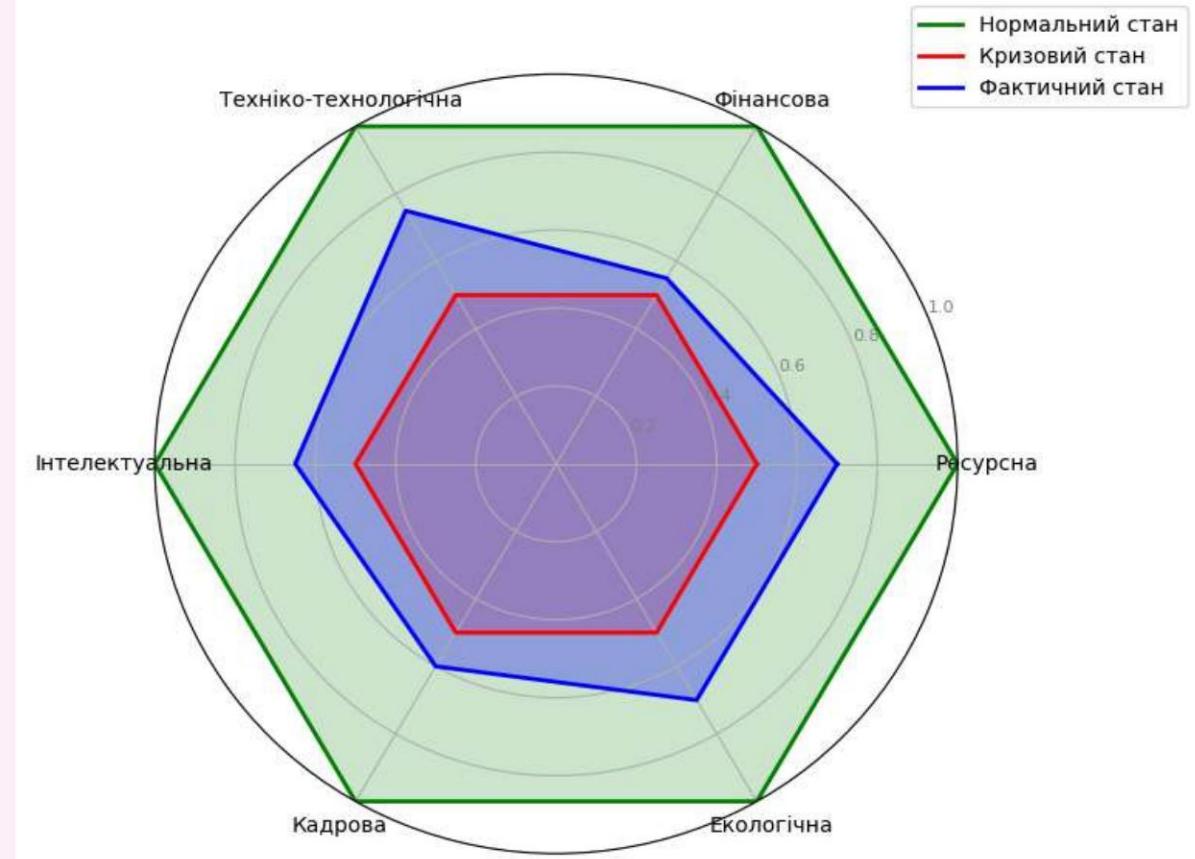
Profile of the integral model of the structure of economic security objects

Odda-Produkt, Norway

Actual state ("as is"): Intermediate polygon. Area: 1.931 (~62.7% of normal; strong technical and technological capacity expansion of 1.49 billion SEK, environmentally friendly through a low carbon footprint, but weak financially due to loss).

The actual area is 37.3% smaller than normal (potential due to investments), but 151% larger than crisis area (moderate risk with a focus on investment and financial security).

Профіль економічної безпеки – Odda-Produkt



GENERAL CONCLUSIONS

Based on the results of the analysis of the enterprises Stolichnyi Household and Oddaproduct AS, it was possible to form a holistic profile of their economic security. The calculated indicators showed which components of security — resource, financial and economic, technical and technological, personnel, intellectual — are within regulatory thresholds, and which require reinforcement.

System assessment using **an integral model revealed** critical or acceptable levels of risk, which allows us to clearly outline **weaknesses**: possible insufficient resource base, wear and tear of fixed assets, low level of technology renewal, inappropriate cost-income ratio, personnel and intellectual gaps.

At the same time, the analysis also revealed **strengths**: stable indicators of financial and economic sustainability, the ability to support necessary social and communal services, and the presence of a management and reporting structure.

The work conducted confirmed that the indicator approach and integrated models are effective tools for diagnosing the economic security of enterprises, especially in the utility and social sectors.

LIST OF SOURCES USED

1. "COMPONENTS OF ECONOMIC SECURITY OF AN ENTERPRISE: AN IMPORTANT SCIENTIFIC ASPECT", Tkachuk G.O., Candidate of Economic Sciences, Associate Professor, Associate Professor, Department of Accounting and Auditing, Odesa National Academy of Food Technologies
2. Theoretical Foundations in Economics and Management: collective monograph / Toporkova O., Lytovchenko O., etc. – International Science Group. – Boston : Primedia eLaunch, 2022. 872 r, Available at : DOI – 10.46299/ISG.2022.MONO.ECON.2
3. Hayes A. Days Sales of Inventory (DSI): Definition, Formula, and Importance. Investopedia. URL:
<https://www.investopedia.com/terms/d/days-sales-inventory-dsi.asp>.
4. Home page of the State Statistics Service of Ukraine. Home page of the State Statistics Service of Ukraine. Statistics of Ukraine. URL: <https://stat.gov.ua/uk>.
5. New letter from the Ministry of Economy dated 21.11.2025 regarding the application of incentive coefficients. Advisor in the field of public URL: <https://radnuk.com.ua/novyny/novyj-lyst-minekonomiky-vid-21-11-2025-shchodo-zastosuvannia-kupikivel-stymuliuchykh-koefitsiientiv/>.
6. LLC "BUDYNOK POBUTU "STOLYCHNYI" [Electronic resource] // Vkursi.pro. – Kyiv, 2025. – Mode access: <https://vkursi.pro/card/tov-budynok-pobutu-stolychnyy-14283958>. – Screen name. – Access date: 11/25/2025.
7. 14283958 – tov "budinok pobutu "stolichnyy" [Electronic resource] // YouControl. – Kyiv, 2025. – Mode access: https://youcontrol.com.ua/catalog/company_details/14283958/. – Screen name. – Access date: 11/25/2025.
8. 14283958 — TOV BUDYNOK POBUTU STOLYCHNYI [Electronic resource] // Opendatabot. – Kyiv, 2025. – Mode access: <https://opendatabot.ua/c/14283958>. – Screen name. – Access date: 11/25/2025.

LIST OF SOURCES USED

9. <https://yra.no/en/company/923572414>
10. Odda Produkt – Odda Digital System. Odda Digital System – Automatisering og digitalisering av din achievement URL: <https://oddadigitalsystem.no/nb/odda-produkt/>.
11. Strong cash flow and solid mine production Interim Report Q3 2025 [Electronic resource] / Boliden AB. – Stockholm : Boliden AB, 2025. – Access mode: <https://investors.boliden.com/sites/boliden-ir/files/pr/202510217058-1.pdf>. – Screen title. – Access date: 25.11.2025.
12. Q3 2025 Interim Report [Electronic resource] / Boliden AB. – Stockholm : Boliden AB, 2025. – Mode Access: https://investors.boliden.com/sites/boliden-ir/files/pr/Boliden_Q3_2025_presentation_0.pdf. – Title from screen. – Access date: 25.11.2025.
13. Boliden Odda [Electronic resource] / Boliden AB. – Stockholm: Boliden AB, 2025. – Access mode: <https://www.boliden.com/operations/smelters/boliden-odda/>. – Screen title. – Access date: 25.11.2025.

Thank you for your attention.