

# Comparative Analysis of Resilience and Marketing Adaptation Strategies: An Integrated Company Resilience Index and a Crisis Planning Model

Alona Tanasiichuk<sup>1</sup>, Liudmyla Dybchuk<sup>2</sup>, Vitalii Nianko<sup>3</sup>, Olha Naumova<sup>4</sup>, Danylo Sidielnikov<sup>5</sup>, Kateryna Ozarko<sup>6</sup>, Anna Shevchuk<sup>7</sup>

## ABSTRACT:

The article examines the resilience strategies and marketing adaptation of Ukrainian enterprises under the conditions of Russia's full-scale war against Ukraine, with a focus on the period 2022–2024. The purpose of the study is to develop and test an integrated resilience index for companies and clusters, as well as a crisis-planning model that combines the financial-export, operational-logistical, marketing, and institutional-organizational dimensions of business resilience. Based on statistical data on Ukraine's foreign trade (State Statistics Service of Ukraine), the TOP-15 export commodity groups were selected and consolidated into three leading export-oriented clusters: agri-food (raw materials and processing), furniture manufacturing, and mechanical engineering and electrical equipment. For each cluster, sub-indices of financial-export, operational-logistical, marketing, and institutional-organizational resilience were calculated, along with an integrated resilience index, which made it possible to identify distinct resilience profiles – “financial-institutional” (agri-food sector), “marketing-operational” (furniture cluster), and a profile of unrealized strategic potential (mechanical engineering and electrical equipment). The analysis demonstrates that marketing adaptation – increasing the share of high value-added products, developing branding, digital sales channels, and geographical diversification – is a critical determinant of long-term resilience and cannot be treated as a secondary element of crisis management. Based on the results of the integrated assessment, cluster-specific directions of marketing adaptation in international markets were formulated and incorporated into a continuous crisis-planning model for enterprises. The practical significance of the study lies in the possibility of applying the proposed approach to prioritize instruments of state and regional export-support policies, as well as to develop corporate resilience strategies and marketing adaptation programs for Ukrainian companies during the war and the post-war recovery period.

*Keywords: Resilience strategy, marketing adaptation, integrated company resilience index, crisis management, marketing strategy, marketing communication, consumer behavior in crisis conditions, branding during a crisis, digital marketing, adaptive marketing tools, brand positioning, innovation adaptability, financial business resilience, corporate social responsibility (CSR), sustainable marketing, anti-crisis marketing, export-oriented clusters, agri-food sector, furniture industry, mechanical engineering*

<sup>1</sup>Professor of the Department of Marketing and Advertising, Vinnytsia Institute of Trade and Economics of State University of Trade and Economics, Ukraine.

<sup>2</sup>Professor of the Department of Management, Marketing and Entrepreneurship, Vinnytsia Cooperative Institute, Ukraine.

<sup>3</sup>Associate Professor at the Department of Marketing Khmelnytskyi National University, Ukraine

<sup>4</sup>Associate Professor at the Management of Foreign Economic Activity of Enterprises Department State Non-Profit Enterprise "State University "Kyiv Aviation Institute" Liubomyra Huzara Avenue, Ukraine

<sup>5</sup>Senior Lecturer of the Department of Marketing State University of Trade and Economics, Ukraine

<sup>6</sup>Associate Professor at the Department of Management and Marketing /Director of the Research Institute of Infocommunications State University of Intellectual Technologies and Communications, Ukraine

<sup>7</sup>Associate Professor of the Department of Management, Marketing and Entrepreneurship, Vinnytsia Cooperative Institute, Ukraine.

## 1. Introduction

The relevance of the chosen topic is driven by the unprecedented turbulence of the business environment, which combines the effects of the COVID-19 pandemic, Russia's full-scale war against Ukraine, the energy crisis, digital transformation, and shifts in consumer behavior. For companies, especially Ukrainian ones, the issue of resilience is no longer theoretical: it directly determines business survival, the preservation of jobs, the ability to integrate into global value chains, and the capacity to attract investment. Under these conditions, there is a need not only for tactical anti-crisis measures but for a systemic approach to building resilience strategies and marketing adaptation.

In practice, enterprises often respond to crises in a fragmented manner: they reduce marketing expenditures, change sales channels, optimize operations, yet lack a comprehensive model that integrates strategic resilience, marketing flexibility, and long-term crisis planning. The absence of integrated tools for assessing company resilience complicates managerial decision-making, comparison of alternative strategies, and justification of investments aimed at strengthening adaptive capacities. Therefore, the development of an integrated resilience index that enables a quantitative assessment of a company's ability to withstand crises and recover constitutes an important scientific and practical task.

The topic gains additional significance in the context of marketing adaptation. Changes in consumer purchasing power, migration processes, business relocation, and the rapid development of digital communication and sales channels require companies to reconsider their marketing strategies, including market segmentation, positioning, product offerings, pricing policies, and promotion tools. A comparative analysis of different resilience strategies and marketing adaptation models makes it possible to identify those approaches that ensure the highest effectiveness under conditions of prolonged instability.

Developing a crisis-planning model based on an integrated resilience index creates an opportunity to shift from reactive to proactive management: to formulate action scenarios in advance, identify critical vulnerability points, and incorporate reserves and flexible marketing solutions. This is particularly important for Ukrainian companies, which simultaneously face military risks, logistical constraints, regulatory changes, and the need to enter new markets.

Thus, the comparative analysis of resilience strategies and marketing adaptation, the development of an integrated company resilience index, and the creation of a crisis-planning model are relevant from both scientific and practical perspectives. This approach aims to bridge the existing gap between theoretical concepts of resilience and the real business need for measurement and management tools, thereby enhancing the competitiveness of companies and their capacity to operate under prolonged crisis challenges.

## 2. Literature Review

In studies of corporate resilience and firms' capacity for marketing adaptation, a significant body of work is devoted to organizational resilience and its measurement. One

of the key trends is the shift from descriptive approaches toward constructing integrated resilience indices at the enterprise and sectoral levels.

Conceptually, it is important to distinguish between descriptive resilience and its quantitative operationalization. Descriptive resilience refers to the qualitative characterization of how firms withstand disruption—e.g., their capacity to anticipate, absorb, adapt, and recover—typically grounded in systems thinking and organizational theory and evidenced through narratives, case-based assessments, and capability descriptions. Quantitative measurement, in contrast, translates this latent multidimensional construct into observable proxies (scales, indicators, or composite indices) that enable benchmarking and comparative analysis. This translation is not neutral: the chosen theoretical definition determines the relevant dimensions, while the measurement model (e.g., reflective vs. formative specification, weighting, normalization, and aggregation rules) determines what the resulting index can validly represent and how it should be interpreted. Therefore, integrated resilience indices should be viewed as theory-informed operationalizations of resilience rather than direct equivalents of the descriptive concept, and their interpretive value depends on the explicit alignment between conceptual dimensions and indicator construction.

For example, H. Dinh et al. (2024), analyzing the resilience of small and medium-sized enterprises in Vietnam, proposed a three-level model in which the integrated resilience index is formed through a combination of reflective and formative constructs that include flexibility, foresight capability, adaptability, and post-shock business recovery. The authors emphasize that it is the combination of these capabilities that determines not only survival but also the potential for strategic growth under prolonged crisis conditions.

In a broader economic context, the idea of an economic resilience index has been shaped since the works of A. Rose (2004, 2014), which are based on a system of short-term indicators linked to an economy's ability to maintain output and employment under shock conditions. Contemporary studies on organizational resilience continue this line of inquiry, integrating resource-based theory, dynamic capabilities, and systems thinking. A review of the literature shows that resilience measurement tools have evolved from early latent resilience scales (Mallak, Somers) to comprehensive models that account for financial, operational, digital, and institutional dimensions (2014).

S. Koch et al. (2009), for example, develop an integrated system of organizational resilience indicators that makes it possible to quantitatively assess the structure of “strong” and “weak” points within a company's internal processes. A separate group of approaches focuses on constructing integrated indices for various systems, from sectors to labor and investment markets. The Global Labour Resilience Index evaluates resilience across nine dimensions, combining structural characteristics of the labor market, institutional conditions, and recovery capacity. A similar logic underlies the global investment risk and resilience index, in which an integrated formula balances risk and resilience indicators, with results presented on a 0–100 scale for convenient comparison across countries and territories. While such indices largely serve as benchmarking tools for investors and regulators, methodologically, they provide important reference points for constructing a resilience index at the level of individual companies.

Sector-specific resilience indices are becoming widespread in applied research. In the postal sector, an integrated development index has been created that includes four

dimensions, reach, reliability, relevance, and resilience, and allows for assessing the contribution of the postal system to economic development and identifying infrastructural bottlenecks. In the area of food systems and climate adaptation, an aquaculture resilience index has been developed to measure the sector's adaptive capacity to climate risks and support regulatory decision-making. For Ukraine, studies of the state's financial resilience under martial law are particularly illustrative: the authors construct an integrated index based on normalized macroeconomic and budgetary indicators and propose threshold values for diagnosing threats.

At the micro level, Ukrainian scholars have been advancing approaches to the integrated assessment of enterprise resilience. L. Lihonenko *et al.* (2016) proposed a methodology for calculating an integrated resilience index that combines indicators of functional (sectoral) and general (integrated) resilience of enterprises, demonstrating that even during wartime, several industries exhibit a positive value of integrated resilience, indicating business adaptation to new conditions. Studies of the digital integrability of industrial facilities, for example, the model of an integrated digital cohesion index using a power plant as a case, show how digital transformation affects informational potential and long-term resilience, including during wartime phases. Similar approaches are applied in studies where an integrated index is used to assess the resilience of individual enterprises or groups of companies from the standpoint of bankruptcy risk and economic endurance.

At the same time, recent publications emphasize that the resilience index itself has limited value unless linked to crisis-planning models. A. Almeida (2024), analyzing the lessons of the COVID-19 pandemic and other disruptive events, proposes a three-phase crisis management model, "pre-crisis preparation – response – post-crisis transformation", in which organizational resilience is understood as the capacity not only to return to the status quo but also to use the crisis as a catalyst for strategic change. Other works develop the concept of proactive crisis management, integrating risk analysis, scenario planning, and indicative resilience thresholds that can be directly linked to an enterprise's integrated resilience index.

A second major body of literature concerns marketing adaptation under crisis conditions. Foreign researchers view crisis marketing as a combination of short-term anti-crisis measures and long-term business model adaptation. Reviews devoted to marketing in "exceptional situations" highlight that the key to resilience lies in flexible marketing strategies, empathetic communication with customers, and rapid reorientation toward digital channels when physical interaction is constrained. Studies of crisis marketing strategies during economic downturns underscore the importance of distinguishing between purely "anti-crisis" responses (cost reduction, portfolio optimization) and "transformational" responses (restructuring the value proposition, investing in digital marketing, strengthening loyalty and brand resilience).

Empirical studies show that marketing adaptation has a direct impact on business performance. For example, according to interregional studies of small retail enterprises, the use of multichannel digital communications combined with CRM systems made it possible to maintain or even increase sales volumes under crisis-related restrictions (2023, 2024).

Other authors emphasize that the COVID-19 pandemic became a "digital bifurcation point" for marketing, compelling companies to shift massively toward

omnichannel models, strengthen data analytics, and restructure mechanisms of customer interaction – developments that directly reinforce the resilience of the business model.

For Ukrainian enterprises operating under full-scale wartime conditions, marketing adaptation is viewed as one of the key determinants of resilience. A. Tanasiychuk, together with a team of Ukrainian researchers, proposed a marketing mechanism for enterprise adaptation under wartime conditions. It includes revising target segments, diversifying sales channels, strengthening the role of digital tools, and consciously increasing brand awareness (2022, 2024). The authors conclude that a systematic marketing approach enables companies to maintain competitiveness even when supply chains and logistics experience severe disruptions. Other Ukrainian studies focus on the organizational and economic mechanisms of marketing adaptation, highlighting the importance of flexible strategies, rapid restructuring of communications, and the integration of digital technologies across all elements of the marketing mix.

In studies examining the impact of international conflicts on global marketing, it is emphasized that adaptation to wartime risks goes beyond traditional crisis marketing: companies must account for the geopolitical sensitivity of communications, the ethical dimension of positioning, and the need to develop scenario-based strategies for operating in different markets. Against this backdrop, the works of A. Tanasiychuk and her colleagues form the concept of export-oriented marketing as a mechanism for the sustainable development of Ukrainian enterprises, highlighting market diversification, the creation of national brands, and the shift toward high value-added products as key vectors for strengthening business resilience.

In summary, the analysis of scientific literature shows that most researchers view company resilience as a multidimensional phenomenon that integrates financial, operational, digital, and marketing components. Integrated resilience indices are actively used to assess economic systems, sectors, and individual enterprises, yet they largely focus either on financial-economic indicators or on general organizational resilience. At the same time, research on crisis marketing and marketing adaptation demonstrates convincingly that the flexibility of marketing strategies, the ability to rapidly reorganize sales channels, communications, and value propositions constitutes one of the decisive determinants of long-term business resilience. Existing scholarly work has so far rarely combined these two directions within a single quantitative model: an integrated index that would simultaneously encompass organizational resilience and marketing adaptability, while being directly embedded in a company-level crisis-planning model, remains a promising but insufficiently developed research avenue. The present study is aimed precisely at filling this gap by proposing an integrated company resilience index and a crisis-planning model oriented toward the comparative analysis of different resilience and marketing adaptation strategies.

### **3. Results of the Study**

Resilience strategies of enterprises in contemporary scholarly debate are viewed as a distinct form of strategic management aimed not so much at avoiding crises as at building a company's capacity to operate and develop under their inevitability. They are often reduced to a set of anti-crisis measures: creating a financial reserve, maintaining a

supply of raw materials, or drafting emergency instructions. This is a “minimalist” approach in which resilience means the ability to avoid operational shutdown during a shock.

The concept of corporate resilience strategies can be interpreted in at least three logical dimensions: as a set of protective measures, as adaptive capacity, and as the ability to transform.

From a “classical” standpoint, resilience strategies are equated with anti-crisis strategies focused on maintaining enterprise functioning during a crisis. This approach is dominated by a defensive logic: accumulating financial reserves, insuring key risks, diversifying suppliers and clients, reserving production capacities, and establishing business continuity plans. Here, a resilience strategy functions primarily as a protective “shield” designed to minimize losses and prevent operational interruption. While this approach is important, it is in a sense static: it assumes that the desired state of the system is known and that the primary objective is to preserve it.

Importantly, firms rarely shift from a purely protective logic to full adaptation or transformation in a single step. In practice, resilience often unfolds through intermediate phases in which the organization moves from crisis avoidance (stabilization and loss containment) to sensemaking and reconfiguration (monitoring weak signals, revising assumptions, and reallocating resources), and only then to strategic renewal (rethinking the value proposition, business model, and positioning). This transition is typically triggered by identifiable organizational cues: persistent performance gaps despite protective measures, escalating uncertainty that invalidates prior plans, learning from early crisis responses, and leadership decisions that legitimize experimentation and cross-functional coordination. Clarifying these intermediate stages helps explain how enterprises gradually change strategic behavior under uncertainty and why some firms remain locked in defensive routines while others progress toward more adaptive and ultimately transformational approaches in dynamic environments.

Another perspective is the adaptive one. Within it, resilience is understood as a company’s ability to alter its structure, processes, and behavior to remain viable in a changing environment. In this interpretation, a resilience strategy includes building flexible organizational forms, developing staff competencies, enabling rapid resource reallocation across activities, and institutionalizing continuous learning from crises. The key factor becomes not so much “protection from impact” as the ability to adjust: modifying the product portfolio, geographic footprint, or partnership structure. This is particularly evident during wartime, when much of Ukrainian business could not remain “frozen” in its pre-war format but was compelled to search for a new configuration of activity.

The third perspective is transformational. Here, resilience strategies are viewed as those that not only allow an enterprise to survive a crisis but also use it as a catalyst for deep change. The company does not merely adapt to new constraints but reconsiders its role in value chains, its target segments, and its business model as a whole. For example, a producer of raw materials may, under the influence of a shock, shift toward manufacturing higher value-added products, redirect its markets, or integrate with partners into a cluster or ecosystem. In this case, resilience manifests as the ability to “leap” – to transition to a qualitatively different level of development.

Across all three approaches, the common feature is that a resilience strategy is not limited to isolated functional decisions (finance, operations, HR, etc.) but constitutes an integrated managerial logic. It inevitably encompasses the firm's market behavior, i.e., marketing, which brings us to the next dimension: marketing adaptation.

Resilience strategies establish the overall framework for an enterprise's response to crisis pressures, yet by themselves remain largely an internal managerial construct. They define the configuration of resources, organizational decisions, and adaptive mechanisms, but they become truly "tested" only at the point where the company interacts with the market environment. It is at this stage that resilience acquires a practical dimension: whether the enterprise can maintain and restore demand, retain customers, reorient sales, and identify new niches and channels. Therefore, the logical continuation of analyzing resilience strategies is examining marketing adaptation as their external manifestation. It is precisely through changes in target segments, value propositions, sales channels, and communications that the resilience strategy becomes "materialized" in concrete market actions. Accordingly, we now turn to the content and strategic approaches to marketing adaptation, treating it not as a secondary instrument but as a key component in shaping and implementing a company's resilience strategy.

Marketing adaptation is not merely "tweaking advertising" or launching a promotional campaign. In a broad sense, it is a company's ability to reconsider to whom, what, how, and under what conditions it offers its products in response to environmental changes. From a tactical perspective, marketing adaptation manifests itself in adjustments to the intensity and channels of communication, price modifications, and the launch of short-term promotional campaigns. This enables rapid responses to declining demand, shifts in consumer sentiment, or the emergence of new barriers (such as logistical disruptions).

However, from a strategic perspective, marketing adaptation has a much broader meaning (Figure 1).

---

#### Marketing adaptation

---

**reconsideration of target markets and segments** (for example, withdrawal from excessively risky regions, entry into new countries or niches);

---

**modification of the value proposition** (shift of emphasis from price to quality, from mass-market to niche, from the product itself to service, reliability, Ukrainian origin, ESG orientation);

---

**transformation of sales channels** (transition from offline-dominated models to various forms of online sales, work through platforms and marketplaces, development of partnership channels);

---

**brand repositioning** (from "cheap and fast" to responsible, resilient, socially meaningful).

---

Figure 1. Strategic orientations of marketing adaptation

Under wartime conditions, marketing adaptation for Ukrainian companies often acquires a third existential dimension. It becomes a means not only of preserving sales but also of affirming the legitimacy and social role of the business: supporting the community, participating in volunteer and CSR initiatives, and communicating transparently about the company's challenges and values. All of this reinforces trust, without which it is impossible to sustain stable relations with customers and partners.

Thus, from the standpoint of an overall resilience strategy, marketing adaptation can be viewed as its external component, ensuring resilience at the market level: it shapes the enterprise's capacity to maintain and restore cash flows, identify new revenue sources, and uphold relationships with key stakeholders. It is precisely at this intersection that the need arises for quantitative measurement of the outcomes of such strategies.

Summarizing the above, it should be emphasized that marketing adaptation is not merely a functional element of the management system but a critical dimension of a company's overall resilience strategy. It is through changes in target segments, value propositions, sales channels, and communication formats that a business's ability to sustain and regain market positions under crisis-induced shifts becomes realized. At the same time, despite its evident importance, such adaptation is mostly described in qualitative terms, which complicates comparisons across enterprises and the development of well-grounded managerial decisions.

This creates the need to shift from a purely descriptive approach to a quantitative measurement of resilience, in which marketing aspects are considered alongside financial, operational, and managerial ones. The response to this need is the development of an integrated company resilience index, which enables the synthesis of heterogeneous indicators into a unified assessment system. Therefore, it is appropriate to focus further on the theoretical and methodological foundations of developing such an index and on defining its structure as a tool for comparative analysis of resilience strategies and marketing adaptation.

At the same time, integrating marketing alongside financial and operational dimensions raises an important measurement challenge: some marketing and managerial variables are not always directly observable in standardized numeric form and may be captured through qualitative or semi-quantitative assessments, which can introduce evaluator subjectivity and reduce comparability across clusters. To strengthen analytical robustness, the index design prioritizes standardized, data-uniform indicators wherever possible (e.g., ratios, frequencies, coverage measures, and documented performance metrics) and applies a structured coding protocol when qualitative inputs are unavoidable. Specifically, qualitative items are translated into predefined ordinal scales with explicit scoring rubrics, a unified indicator dictionary, and consistent reference periods; additionally, the evaluation procedure can be supported by multi-rater scoring and inter-rater agreement checks to minimize individual bias. This emphasis on indicator standardization, normalization, and uniform data treatment improves cross-cluster and cross-sector comparability and enhances the reliability of the integrated resilience measurement.

Resilience and marketing adaptation strategies are inherently multidimensional. They simultaneously affect finance, operations, personnel, markets, reputation, and ESG dimensions. For scientific analysis and practical management, verbal descriptions are insufficient; a tool is needed that enables the consolidation of different aspects of resilience into a coherent system, facilitates comparison across companies or industries, and monitors resilience dynamics over time. Such a form of generalization is the integrated company resilience index. Conceptually, it can be interpreted in different ways.

On the one hand, it may serve as a "ranking" index designed to position enterprises by their level of resilience. In this case, the emphasis is on comparison: which

company is more resilient, which sector demonstrates better performance, and which configurations of strategies yield higher results. This approach is useful for macro-level analysis but does not always provide an in-depth understanding of the internal structure of resilience.

On the other hand, the index can be viewed as a diagnostic tool aimed at identifying a company's strengths and weaknesses. In this interpretation, the key element is not the "total score" but the structure of the index and the division into sub-indices (Figure 2).

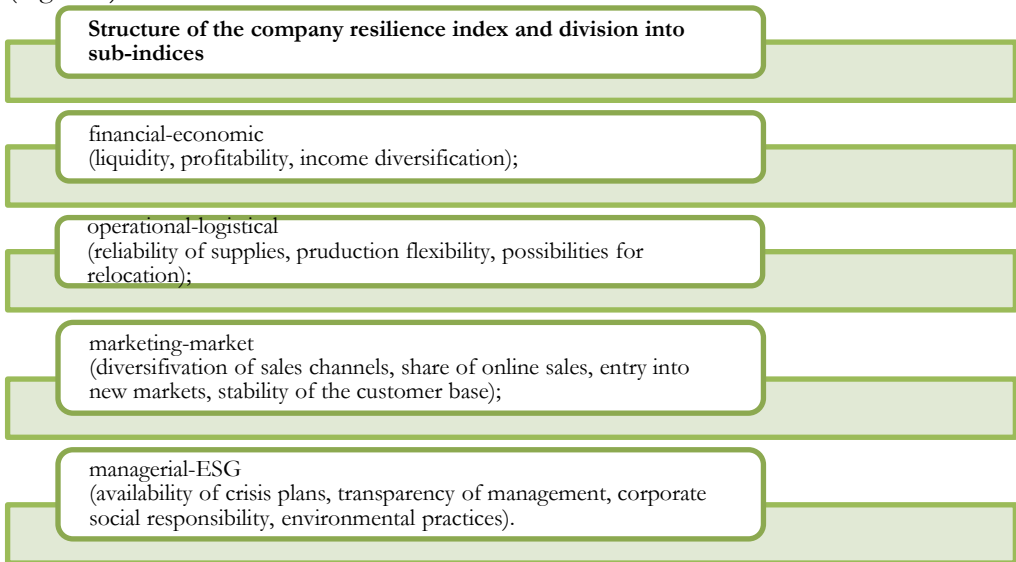


Figure 2. Structure of the Company Resilience Index and Division into Sub-Indices

Under this approach, marketing adaptation does not become "lost" among financial indicators but acquires its own clearly defined dimension. This makes it possible, for example, to identify companies with high financial resilience but weak marketing adaptation (risk of losing markets in the medium term), or conversely, businesses with well-developed marketing resilience but insufficient financial reserves (risk of "burning out" during a prolonged crisis).

For the study of Ukrainian business under wartime conditions, the integrated resilience index serves as a convenient tool for comparative analysis of strategies: different configurations of resilience strategies and marketing adaptation translate into different index values and subcomponents. This allows for not only descriptive but also quantitatively substantiated conclusions.

Since the integrated company resilience index synthesizes the effects of financial, operational, and marketing factors into a single metric, it functions as an important diagnostic tool for assessing the current state of an enterprise. However, the index itself does not define managerial actions: it shows where a problem arises and to what extent resilience is compromised, but it does not answer the questions of how and when the enterprise should respond to the identified threats.

Therefore, the next step is to integrate the results of the index-based assessment into a coherent crisis-management system. This involves developing a crisis-planning model in which the integrated resilience index and its sub-indices serve as triggers for initiating specific action scenarios, determining priorities for resource allocation, and adjusting resilience and marketing-adaptation strategies. Such a model ensures the transition from static measurement of resilience to dynamic, proactive management under conditions of uncertainty.

If the resilience strategy answers the question “who we aim to be,” and the integrated resilience index answers “to what extent we currently are,” then the crisis-planning model defines “how exactly we act over time under uncertainty.” In this context, it is appropriate to distinguish between two fundamentally different approaches to organizing crisis planning (Table 1).

Table 1. Characteristics of approaches to crisis planning

| Approach to crisis planning | Content and characteristics of the approach   |
|-----------------------------|---|
| Episodic                    | A crisis is viewed as an exceptional, one-time event: “it occurred – the company reacted – operations returned to normal.” Planning is reduced to preparing individual documents “in case of X,” which describe actions for specific scenarios (supply disruption, power outage, sharp decline in demand, etc.). In this logic, the crisis-planning model is static and exists “alongside” the strategy, without being integrated into the everyday management system.  |
| Continual                   | This approach is based on the assumption that uncertainty and shocks are not exceptions but a constant background of business activity – an assumption that closely reflects the realities of a wartime economy. Crisis planning is seen as a continuous process that includes regular review of risks and scenarios, short planning cycles, continuous monitoring of indicators (including the integrated resilience index), and the use of predefined “triggers” to activate corresponding action scenarios. Such an approach implies the organic integration of the crisis-planning model into the system of strategic and operational management. |

The synthesis of the data in Table 1 indicates that the episodic approach to crisis planning is suitable only for a relatively stable environment in which crisis events are viewed as exceptions to the “norm.” Under such conditions, the crisis-planning model effectively functions as a formal appendix to the strategy and does not provide flexible responses to prolonged or recurring shocks. In contrast, the continual approach proceeds from the premise that uncertainty and destabilizing factors constitute a constant background for business operations and therefore require not one-off anti-crisis measures but a continuous, embedded planning logic integrated into the management system.

Within the continual approach, the crisis-planning model can be interpreted as a cyclical process whose key elements and their marketing dimension are summarized in Table 2.

In such a model, the resilience strategy, marketing adaptation, and the integrated index cease to be separate elements and form a unified system: the strategy sets the principles and permissible boundaries for decisions; marketing adaptation constitutes the “front line” of response to changes in demand, customer behavior, and market opportunities; the index provides a quantitative picture of the system’s condition; the

crisis-planning model structures managerial actions depending on how external conditions and index values evolve.

Table 2. Continual crisis-planning model combined with marketing-adaptation strategies

| Element of the continual model                           | Content of managerial actions   | Marketing dimension (adaptation)   |
|--|---|--|
| Regular review of risks and scenarios                    | Regular and systematic analysis of external and internal risks, taking into account changes in the security environment, logistics, and regulatory conditions. Development and updating of event scenarios. | Assessment of changes in target markets, monitoring demand dynamics, consumer behavior, and competitor actions; reassessment of risks related to the loss of segments, sales channels, and key clients.  |
| Short planning cycles (“sprints”)                        | Introduction of short strategic-operational planning cycles (quarterly, monthly) with regular adjustment of priorities, resources, and objectives depending on the current situation.                       | Refinement of marketing objectives for each cycle (sales volumes, share of online channels, entry into new markets), adjustment of the toolkit (communication channels, budgets, promotion formats, product-mix strategy).   |
| Systematic monitoring of the integrated resilience index | Continuous tracking of the dynamics of the integrated index and its sub-indices (financial, operational, managerial, etc.) as a generalized indicator of the enterprise’s condition.                        | Monitoring of marketing indicators included in the index: demand dynamics, sales structure by channel, customer retention levels, share of new markets and products, effectiveness of communication campaigns.   |
| “Triggers” and response scenarios                        | Identification of threshold values of indicators (sub-indices) at which predefined anti-crisis action packages are activated (changes in budget, cost structure, or operational modes).                     | Activation of marketing-adaptation scenarios: restructuring sales channels (transition to online, changes in channel mix), adjustment of pricing policy, brand repositioning, modification of the product portfolio (e.g., focusing on essential goods or export-oriented products). |

Thus, the continual crisis-planning model, supplemented by a marketing dimension, makes it possible to view the resilience strategy, marketing adaptation, and the integrated resilience index not as isolated, disconnected components but as an interrelated system. Within such a system, the strategy defines the overall development guidelines, marketing adaptation ensures flexible interaction with the market environment, the integrated index functions as a quantitative “state sensor,” and the crisis-planning model determines the sequence and logic of managerial actions over time.

Accordingly, at the final stage of the theoretical analysis, it is appropriate to summarize how these elements operate collectively and what significance their integration holds for further research on the resilience of Ukrainian enterprises during wartime.

Considering resilience strategies and marketing adaptation from different angles, from protective to transformational, from tactical to strategic, reveals that they ultimately converge on a single key question: how a company structures its behavior not only to survive a crisis but also to preserve its development potential. The integrated resilience index makes it possible to translate the answer into a quantitative dimension: it shows how the implemented strategies (financial, operational, marketing, managerial) are reflected in the actual level of resilience. The crisis-planning model, in turn, provides the process logic: how these strategies are applied, adjusted, and evaluated within real crisis cycles.

For assessing Ukrainian businesses and individual industries during wartime, this combination offers a highly powerful analytical toolkit (Figure 3).

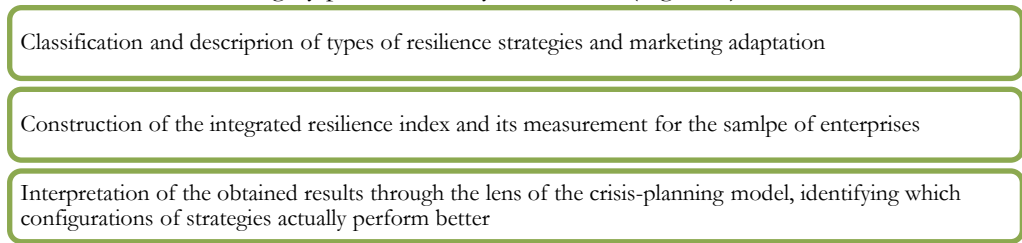


Figure 3. Conceptual scheme of the interconnection between resilience strategies, marketing adaptation, the integrated resilience index, and the crisis-planning model of an enterprise under wartime conditions

The conceptual scheme presented in Figure 3 reflects a holistic view of enterprise resilience as the result of interaction among four key elements: resilience strategies, marketing adaptation, the integrated resilience index, and the continual crisis-planning model. Resilience strategies set long-term development guidelines and the desired level of resilience; marketing adaptation ensures flexible interaction with the market environment; the integrated index enables quantitative assessment of the achieved level of resilience; and the crisis-planning model structures the sequence of managerial decisions over time.

Thus, a theoretical and methodological framework has been formed, which can subsequently serve as the basis for an empirical study of the resilience of Ukrainian enterprises and individual industries during wartime. Applying this framework will make it possible not only to describe existing resilience and marketing-adaptation strategies but also to conduct their comparative quantitative assessment, identify the most effective configurations, and formulate practical recommendations for strengthening corporate resilience under prolonged uncertainty.

In addition, the unified resilience–marketing–planning framework is consistent with international crisis-management and resilience research, yet the Ukrainian wartime context reveals both convergences and important divergences when compared with global crisis cases (e.g., pandemic shocks, natural disasters, or financial downturns). The convergence lies in the logic of moving from protective actions to adaptive reconfiguration and, in some cases, transformational renewal, as well as in the need to monitor resilience through structured indicators and to institutionalize short planning cycles under uncertainty. The divergence is driven by the protracted, multi-source nature of wartime disruption: simultaneous physical-security risks, infrastructure and energy instability, forced reallocation of labor, logistics corridor constraints, and heightened geopolitical and reputational sensitivity in international markets. These conditions make marketing adaptation not merely a supporting function but a pivotal mechanism that connects internal resilience capabilities with external market survival and export reorientation. By explicitly embedding marketing adaptation into both the integrated resilience index and the continual crisis-planning logic, the proposed scheme extends established multidimensional resilience models toward a more war-specific, cluster-comparative analytical design.

Summarizing the results of the theoretical analysis, it can be argued that an enterprise's resilience is formed at the intersection of three complementary dimensions: resilience strategies, marketing adaptation, and institutionalized crisis-planning mechanisms. Resilience strategies evolve from purely protective ones, aimed at minimizing losses, to adaptive and transformational ones, within which a crisis is viewed as a driver of structural change and a rethinking of the business model. Marketing adaptation, in turn, represents the external manifestation of these strategies: it is through changes in target segments, value propositions, sales channels, and communications that an enterprise's ability to maintain and restore market positions under wartime conditions and prolonged uncertainty is realized.

The proposed integrated company resilience index makes it possible to translate the multidimensional content of resilience and marketing-adaptation strategies into a quantitative framework, structuring it into individual sub-indices and identifying the marketing dimension as an independent component. The continual crisis-planning model, supplemented by a marketing aspect, provides the process logic for applying these strategies: from the regular review of risks and short planning cycles to the monitoring of the integrated index and the activation of predefined response scenarios. Taken together, this allows resilience strategy, marketing adaptation, the integrated resilience index, and the crisis-planning model to be viewed as a unified system capable of supporting the viability and development of an enterprise under wartime economic conditions.

This synthesis also raises an important empirical question: under crisis conditions, by which mechanisms can enterprises not only preserve viability but sustain development potential and competitive stability over time? While the proposed resilience–marketing–planning system is theoretically coherent, its practical value depends on whether integrated planning and index-based monitoring consistently translate into superior performance outcomes (e.g., demand retention, market reorientation, and strategic renewal) relative to fragmented or purely defensive responses. Therefore, the framework requires broader empirical validation, including tests of robustness and transferability across diverse sectors, cluster structures, and environmental settings. Such validation should explicitly examine boundary conditions—i.e., where the integrated system works best, where it may be constrained (data availability, managerial capacity, market turbulence), and which contextual triggers determine whether firms progress from protective to adaptive and transformational trajectories.

The theoretical and methodological framework established here provides the basis for moving from the conceptual level to empirical analysis. The next stage of the study is linked to the practical verification of the proposed approach: constructing an integrated resilience index for a sample of Ukrainian enterprises (or individual sectors), assessing their resilience and marketing-adaptation strategies, and interpreting the obtained results through the lens of the continual crisis-planning model.

The following section will present the methodology for calculating the integrated resilience index, describe the sample of companies under study and the data sources, and provide an empirical assessment of the resilience of Ukrainian businesses under wartime conditions, followed by a comparative analysis of the identified strategies and their outcomes.

The transition from theoretical–methodological provisions to empirical analysis requires specifying which sectors of the Ukrainian economy should be considered potential carriers of resilience and objects of marketing adaptation in international markets. The proposed framework of the integrated resilience index and the continual crisis-planning model implies that such “locomotives” are primarily those sectors capable of:

1. generating a substantial share of foreign-currency revenues;
2. maintaining or expanding their presence in external markets amid prolonged wartime conditions;
3. transitioning from a raw-material model to higher value-added products through targeted marketing adaptation.

Since the full-scale invasion began in February 2022, the years 2022–2024 are particularly indicative for assessing how different commodity groups responded to the shock and subsequent adaptation. Conditionally, 2022 can be viewed as the first, “shock” year of the war, when export flows underwent abrupt restructuring; 2023 as a stage of searching for new logistics routes and markets; and 2024 as a phase of partial stabilization and selective recovery.

For the purpose of an initial selection of industries for subsequent in-depth analysis, the commodity groups were ranked by export volumes, and the TOP-15 main export positions of Ukraine for 2022–2024 were identified. For each group, export volumes, the share in total merchandise exports in 2024, export dynamics in 2023 and 2024 relative to 2022, as well as the type of product and the approximate concentration of sales markets were calculated. The summarized results are presented in Table 1.

Table 1. Calculation of indicators for the main export commodity groups, TOP-15, 2022–2024

| Industry (HS code)                         | Exports, thousand USD |              |              | Sector share in Ukraine’s total exports, % (2024) | Export change 2023/2022, % | Export change 2024/2022, % | Type of product                         | Export market concentration index |
|--|-----------------------|--------------|--------------|---|----------------------------|----------------------------|---|-----------------------------------|
|  | 2022                  | 2023         | 2024         |   |                            |                            |   |                                   |
| 10 Cereals                                 | 9108153,48            | 8307010,14   | 9418272,50   | <b>22,6</b>                                       | <b>-8,8</b>                | <b>+3,4</b>                | raw materials (agricultural products)   | medium–high                       |
| 15 Animal or vegetable fats and oils       | 5948570,73            | 5649063,56   | 5756448,90   | <b>13,8</b>                                       | <b>-5,0</b>                | <b>-3,2</b>                | semi-finished / processed food products | medium                            |
| 12 Seeds and fruits of oil-bearing plants  | 3757692,29            | 2819473,69   | 3393750,50   | <b>8,1</b>  | <b>-25,0</b>               | <b>-9,7</b>                | raw materials (oilseed crops)           | medium                            |
| 72 Ferrous metals                          | 4532366,88            | 2649562,11   | 3096362,00   | <b>7,4</b>  | <b>-41,5</b>               | <b>-31,7</b>               | semi-finished products (metal products) | high                              |
| 26 Ores, slag, and ash                     | 3079695,56            | 1870049,74   | 2940865,70   | <b>7,0</b>  | <b>-39,3</b>               | <b>-4,5</b>                | raw materials (ores)                    | high                              |
| 85 Electrical machinery and equipment      | 2 557 286,65          | 2 269 618,81 | 2 278 089,20 | <b>5,5</b>  | <b>-11,2</b>               | <b>-10,9</b>               | finished industrial products            | medium                            |
| 23 Residues and waste of the food industry | 1081829,18            | 1397446,68   | 1481089,40   | <b>3,5</b>  | <b>+29,2</b>               | <b>+36,9</b>               | semi-finished products / feed           | medium                            |

| Industry (HS code)                                   | Exports, thousand USD |            |            | Sector share in Ukraine's total exports, % (2024) | Export change 2023/2022, % | Export change 2024/2022, % | Type of product                                       | Export market concentration index |
|--|-----------------------|------------|------------|---|----------------------------|----------------------------|---|-----------------------------------|
|  | 2022                  | 2023       | 2024       |   |                            |                            |   |                                   |
| 44 Wood and articles of wood                         | 1880210,35            | 1535846,73 | 1460673,90 | 3,5   | -18,3                      | -22,3                      | semi-finished products (timber, wood processing)      | medium-high                       |
| 02 Meat and edible meat offal                        | 923757,46             | 892295,24  | 1052793,30 | 2,5   | -3,4                       | +14,0                      | processed food products                               | high                              |
| 73 Articles of ferrous metals                        | 1051372,10            | 16131,53   | 947251,30  | 2,3   | -98,5                      | -9,9                       | finished industrial products                          | medium                            |
| 94 Furniture   | 805957,75             | 840723,65  | 909007,60  | 2,2   | +4,3                       | +12,8                      | finished products with high value added               | medium                            |
| 84 Nuclear reactors, boilers, machinery              | 1174973,53            | 987282,80  | 864876,00  | 2,1   | -16,0                      | -26,4                      | finished industrial products (mechanical engineering) | medium                            |
| 17 Sugar and sugar confectionery                     | 299573,88             | 596323,53  | 651650,90  | 1,6   | +99,1                      | +117,6                     | processed food products                               | high                              |
| 04 Milk and dairy products; bird eggs; natural honey | 452080,01             | 403527,59  | 489315,50  | 1,2   | -10,7                      | +8,2                       |   |                                   |

Source: generated based on State Statistics Service of Ukraine [2025]

The data in Table 1 show that in the structure of Ukraine's merchandise exports during the first three years of the full-scale war, agricultural raw-material positions play a dominant role. The combined share of the three main agricultural groups – cereals (HS 10), animal or vegetable fats and oils (HS 15), and oilseeds and oil-bearing fruits (HS 12) – exceeds 40% of total goods exports in 2024 (22.6%, 13.8%, and 8.1%, respectively). While cereals already surpassed their 2022 level in 2024 (+3.4%), fats and oils and oilseed crops continue to lag behind (-3.2% and -9.7%). This indicates that the agricultural sector as a whole demonstrated strong export endurance under wartime conditions, but a significant portion of shipments remains raw-material based, which limits the potential for increasing value added.

Traditional metallurgical and mining industries show substantial vulnerability. Exports of ferrous metals (HS 72) in 2024 remain one-third below the 2022 level (-31.7%), while ores, slag, and ash (HS 26) are 4.5% lower. The sharpest decline occurred in 2023 (-41.5% and -39.3%, respectively), reflecting the effects of destroyed capacities, blocked traditional port routes, and an overall shift in the geography of supply. Although their share in exports remains significant (7.4% and 7.0% in 2024), these sectors appear structurally vulnerable from a resilience standpoint, and the possibilities for marketing adaptation are significantly constrained by logistical and infrastructural factors.

At the same time, a group of products stands out in the export structure that, while having a smaller weight, demonstrates positive dynamics and high potential for expanding higher value-added production. These include, in particular:

residues and waste of the food industry (HS 23) – export growth of 29.2% in 2023 and 36.9% in 2024 compared to 2022, reflecting the strengthening role of processing and the export of feed and by-products;

meat and edible meat offal (HS 02) – recovery and an export increase of 14.0% relative to 2022;

furniture (HS 94) – an increase of 12.8% in 2024 compared to 2022, supported by sustained demand from European markets;

sugar and sugar confectionery (HS 17) – effectively a doubling of exports in 2023 and more than 117% growth in 2024 compared to 2022;

milk, dairy products, eggs, and honey (HS 04) – after a decline in 2023, exports in 2024 show an 8.2% increase relative to the 2022 baseline.

A common feature of these groups is that a significant share of them belongs to processed food products or goods with relatively high added value (furniture, confectionery). These are precisely the segments in which marketing adaptation – brand development, work on positioning, product adaptation, packaging, and sales channels to meet the requirements of target markets – acts as a key factor of resilience and growth.

The positions related to mechanical engineering and electrical equipment, electrical machinery and equipment (HS 85), and reactors, boilers, machinery (HS 84), are of particular interest. Although their export volumes currently lag behind agricultural and raw-material groups (5.5% and 2.1% respectively in 2024), and their dynamics for 2022–2024 are negative (–10.9% and –26.4%), these categories consist of finished industrial products potentially integrated into European and global value chains. For these groups, marketing adaptation is connected not so much with mass B2C branding as with B2B strategies: cooperation with foreign partners, participation in clusters, and compliance with the standards and specifications of target markets.

Another important dimension reflected in Table 1 is the concentration of export markets. For several key commodity groups (cereals, ores, meat, and certain food products), it is assessed as medium or high, indicating dependence on a limited number of importing countries. This increases sensitivity to regulatory decisions of individual partners, changes in customs regimes, and logistical constraints. Accordingly, market diversification and entry into new geographic niches should be considered one of the priority directions of marketing adaptation for these sectors.

Summarizing the results of the analysis, several conclusions can be drawn for the subsequent stages of the study:

First, in the first three years of the full-scale war, the resilience of Ukraine's merchandise exports is largely ensured by the agri-food block; however, its structure remains predominantly raw-material based, which limits long-term potential.

Second, there is noticeable growth in the segments of processed food products and furniture, where marketing adaptation plays a key role in securing positions in international markets.

Third, despite the current decline in volumes, mechanical engineering and electrical equipment retain important strategic potential as carriers of high value-added, provided that targeted resilience strategies are implemented and entry into specialized export niches is achieved.

These conclusions form the basis for the next step of the study – identifying those sectors that combine a significant share in exports, signs of adaptation under wartime conditions, and the potential to transition to higher value-added products, and for which it is appropriate to construct an integrated resilience index and develop targeted recommendations for marketing adaptation in international markets.

From a longer-term perspective, the proposed focus on sectors with the potential to move toward higher value-added production also opens a clear avenue for further research on structural transformation. A particularly relevant question is whether the selected clusters demonstrate a genuine reduction in raw-material dependence over time—observable, for instance, through changes in the product-mix composition, the relative weight of processed vs. primary outputs, and the stability of export performance beyond short-term recovery effects. In this context, marketing adaptation can be analytically treated not only as an accompanying response but as an accelerating mechanism that supports upgrading by enabling market diversification, repositioning, and the development of differentiated value propositions. A longitudinal, comparative design across multiple years (and, where feasible, across different crisis contexts) would allow the identification of recurring patterns of upgrading, path dependence, and strategic “pivot points” that distinguish temporary adaptation from sustained value-added transformation.

To move from the analysis of individual commodity groups to actual sectors and clusters, between which resilience and marketing-adaptation strategies can be compared, it is necessary to aggregate the data from Table 1 to a higher level. The logic of this transition is as follows:

- individual HS codes (10, 12, 15, 23, 02, 17, 04) represent different links within a single agri-food chain, from raw materials to processed food products;
- HS code 94 is essentially a “pure” representative of the furniture industry, a sector with high value added;
- HS codes 84 and 85 cover key segments of mechanical engineering and electrical equipment associated with the production of complex industrial goods..

Therefore, based on the data in Table 1, the export indicators were aggregated across the three selected clusters. For each cluster, the total export volume for 2022–2024 was calculated, as well as its share in Ukraine’s total goods exports in 2024, and the change in exports in 2023 and 2024 relative to 2022. The obtained results are presented in Table 2.

Table 2. Aggregated export indicators of the three clusters, 2022–2024 (based on Table 1)

| Cluster   | Composition by HS codes    | Export volume, thousand USD |            |            | Share in Ukraine’s goods exports, % (2024) | Export change 2023/2022, % | Export change 2024/2022, % |
|---|----------------------------|-----------------------------|------------|------------|--|----------------------------|----------------------------|
|   |                            | 2022                        | 2023       | 2024       |  |                            |                            |
| Agri-food (processing + raw materials)          | 10, 12, 15, 23, 02, 17, 04 | 21571657,0                  | 20065140,4 | 22243321,0 | ≈ 53,3                                     | ≈ -7,0                     | ≈ +3,1                     |
| Furniture industry                              | 94                         | 805957,75                   | 840723,65  | 909007,60  | ≈ 2,2                                      | ≈ +4,3                     | ≈ +12,8                    |
| Mechanical engineering and electrical equipment | 84, 85                     | 3732260,18                  | 3256901,61 | 3142965,20 | ≈ 7,5                                      | ≈ -12,7                    |                            |

The indicators in Table 2 clearly illustrate the structure and dynamics of the three selected clusters during the first three years of the full-scale war.

First, the agri-food cluster (processing + raw materials) is the unquestionable “anchor” of export resilience: in 2024, it accounts for approximately 53.3% of Ukraine’s merchandise exports, and its total export volume (USD 22.24 billion) already exceeds the 2022 level. Despite a decline in 2023 ( $\approx -7.0\%$  relative to 2022), in 2024 the cluster shows positive dynamics ( $\approx +3.1\%$  relative to 2022), indicating adaptation to new logistical conditions and sustained demand for Ukrainian agricultural and food products. At the same time, the preliminary analysis of Table 1 showed that a large share of this cluster still consists of raw materials, whereas processed food exports are only beginning to accelerate. This means that from a resilience-strategy perspective, the agri-food cluster combines high financial resilience with largely untapped potential for increasing value added through marketing adaptation.

Second, the furniture industry occupies a relatively small share of total exports ( $\approx 2.2\%$  in 2024), yet it demonstrates consistently positive performance: export growth of  $\approx 4.3\%$  in 2023 and  $\approx 12.8\%$  in 2024 compared to 2022. In other words, even under wartime conditions, this cluster not only maintained its external positions but managed to strengthen them. Given that furniture is a high value-added finished product and that the EU is its main export market, the furniture cluster can be regarded as a sector with a relatively high integrated resilience index, where marketing strategies, design, branding, cooperation with retail networks, and online channels, play a decisive role.

Third, mechanical engineering and electrical equipment (HS 84, 85) are in a more challenging position. The cluster’s combined share in exports in 2024 is around 7.5%, yet export volumes are declining: in 2023, approximately  $-12.7\%$  compared to 2022, and in 2024 the downward trend persists. This reflects the sensitivity of capital-intensive industries to destruction, logistical constraints, and disruptions of cooperative supply chains. At the same time, the very nature of the products, complex equipment and machinery, indicates the cluster’s strong technological and engineering potential. Therefore, despite the decline in current export indicators, mechanical engineering and electrical equipment retain strategic relevance as carriers of high value added and as potential participants in European value chains.

In summary, the analysis of Table 2 makes it possible to formulate several key conclusions for the next stage of the research:

- The agri-food cluster provides more than half of export revenues and has already surpassed the “shock” level of 2022, yet it requires a shift of emphasis from raw materials to processing and branded products.
- The furniture industry, despite its modest scale, demonstrates the strongest growth dynamics and is a typical example of a high value-added sector in which resilience is directly linked to marketing adaptation and work with EU markets.
- Mechanical engineering and electrical equipment currently face financial-export and operational challenges, but possess significant technological and strategic potential that can be realized through targeted resilience strategies and specialized B2B marketing.

Therefore, in the subsequent sections of the study, it is appropriate to focus on these three clusters by constructing an integrated resilience index for each of them (taking into account financial-export, operational-logistical, marketing, and institutional

dimensions), conducting a comparative analysis of resilience strategies and models of marketing adaptation, and developing targeted recommendations to strengthen their resilience under prolonged wartime conditions.

To move from stating the export scale of the clusters (Table 2) to a comparative analysis of resilience strategies and marketing adaptation, the single dimension of “export volume/dynamics” is no longer sufficient. To understand why some clusters are more resilient than others, and through which mechanisms their resilience is formed, it is necessary to decompose resilience into several interrelated dimensions: financial-export, operational-logistical, marketing, and institutional-organizational.

It is for this purpose that the system of indicators for the integrated resilience index is developed. Within this framework, each of the three clusters is assessed using a set of quantitative and qualitative indicators. The consolidated list of indicators, the principles of their scaling, and preliminary (expert) assessments are presented in Tables 3–6.

Table 3. System of indicators for constructing the integrated resilience index of clusters. Financial-export dimension (I\_F)

| Code | Indicator                          | Unit         | Direction (“more = better”) | Agri-food | Furniture | Mechanical engineering + electrical equipment | Assessment (1–3) and rationale   |
|------|------------------------------------|--------------|-----------------------------|-----------|-----------|---|--|
| F1   | Export of the cluster in 2024      | thousand USD | ↑                           | 22243321  | 909008    | 3142965                                       | Largest – agri-food (3), then machinery (2), furniture (1)                 |
| F2   | Change in exports 2024/2022        | %            | ↑                           | +3,1      | +12,8     | –15,8   | Best dynamics – furniture (3), then agri-food (2), weakest – machinery (1) |
| F3   | Share in Ukraine’s exports in 2024 | %            | ↑                           | 53,3      | 2,2       | 7,5   | Agri-food (3), machinery (2), furniture (1)                                |

Table 3 records the financial-export resilience of the clusters using three key indicators: export scale (F1), dynamics 2024/2022 (F2), and share in Ukraine’s total exports (F3), which are aggregated into the sub-index I\_F. The scale for qualitative indicators is: 1 – low level / weak position; 2 – medium; 3 – high (Table 4).

Table 4. Final sub-index I\_F (average of F1–F3, scale 1–3). Financial-export dimension (I\_F)

| Cluster                                       | F1 (1–3) | F2 (1–3) | F3 (1–3) | I_F = (F1+F2+F3)/3 |
|---|----------|----------|----------|--------------------|
| Agri-food                                     | 3        | 2        | 3        | <b>2,67</b>        |
| Furniture                                     | 1        | 3        | 1        | <b>1,67</b>        |
| Mechanical engineering + electrical equipment | 2        | 1        | 2        | <b>1,67</b>        |

The obtained values show the following picture:

– The agri-food cluster has the highest financial–export sub-index,  $I_F = 2.67$ . This reflects a combination of very large export volumes and a dominant share in total exports (53.3%), together with moderately positive dynamics (+3.1%). Thus, from the standpoint of financial resilience and export contribution, this cluster is the unquestionable leader.

– The furniture cluster has  $I_F = 1.67$ : small export volumes and a small export share, but strong positive dynamics (+12.8% relative to 2022). This means that its financial–export resilience is still constrained by scale, yet the cluster is in a growth phase.

– Mechanical engineering and electrical equipment also have  $I_F = 1.67$ , but with the opposite structure: their export share is higher than that of furniture (7.5%), but the dynamics are negative (–15.8%). This indicates that although the cluster has strong export traditions, the financial component of its resilience is weakened by declining volumes.

Thus, based on Tables 3–4, it can be concluded that financial–export resilience under wartime conditions is strongest in the agri-food cluster, while the furniture industry and mechanical engineering are at different stages: the former in a growth phase from a low baseline, the latter in a contraction phase but still retaining notable weight.

To ensure that the financial–export assessment is not disconnected from real production and logistical constraints, the next step is to analyse the operational–logistical dimension of resilience. This dimension makes it possible to understand the extent to which the observed export results are supported by the clusters’ ability to maintain production and supply under disrupted supply chains, enterprise relocation, and changes in transportation routes. The corresponding qualitative indicators are grouped in Table 5.

Table 5. System of indicators for constructing the integrated resilience index of clusters. Operational–logistical dimension ( $I_O$ )

| Code | Indicator (qualitative assessment)   | Scale description   | Agri-food   | Furniture   | Mechanical engineering + electrical equipment  |
|------|--|---|---|---|--|
| O1   | Logistics resilience (availability of alternative routes, dependence on bottlenecks) | 1 – highly vulnerable<br>2 – medium<br>3 – relatively resilient           | 2 (new routes, but strong dependence on external corridors)     | 3 (orientation toward road/rail transport to the EU, lower dependence on ports) | 2 (logistics feasible, but equipment is heavy; part of capacities located in risk zones) |
| O2   | Flexibility/relocatability of production   | 1 – location-dependent<br>2 – limited flexibility<br>3 – high flexibility | 1 (processing tied to raw-material base and specific locations) | 3 (many SMEs, easier to relocate)   | 2 (capital-intensive facilities, but partial relocation is possible)                     |

Table 5 assesses operational–logistical resilience using two indicators: logistics resilience (O1) and production flexibility/relocatability (O2). Both are qualitative but critical under wartime conditions.

To enable comparison across clusters not only at the level of individual indicators but also at the level of a consolidated result, the qualitative assessments for O1 and O2 should be aggregated into a single sub-index of operational–logistical resilience,  $I_O$ . The aggregated values of this sub-index for the three clusters are presented in Table 6.

Table 6. Final sub-index I\_O (average of O1–O2). Operational–logistical dimension (I\_O)

| Cluster                                       | O1 | O2 | I_O  |
|---|----|----|------|
| Agri-food                                     | 2  | 1  | 1,50 |
| Furniture                                     | 3  | 3  | 3,00 |
| Mechanical engineering + electrical equipment | 2  | 2  | 2,00 |

The results show:

- The agri-food cluster received I\_O = 1.50, the lowest value among the three clusters. On the one hand, it has alternative routes (the Danube, land corridors), reflected in the O1 score of 2. On the other hand, processing capacities are strongly tied to the raw-material base and specific territories (O2 = 1). This makes the agri-food cluster operationally vulnerable despite its financial resilience.

- The furniture industry has the highest I\_O = 3.00. Furniture production is technologically more flexible; a large share of enterprises are small and medium-sized, making relocation easier (O2 = 3), and logistics rely mainly on road and rail routes to the EU (O1 = 3). Thus, the operational-logistical resilience of the furniture cluster is the strongest.

- Mechanical engineering and electrical equipment have I\_O = 2.00, an intermediate level. Logistics are feasible (O1 = 2), but the products are capital-intensive, heavy, and sometimes oversized; relocation of production is difficult, although possible for certain lines (O2 = 2). This indicates moderate operational resilience.

Based on Tables 5–6, it can be stated that the furniture cluster is the leader in operational-logistical resilience, while the agri-food cluster, despite its export weight, faces structural constraints linked to its dependence on raw materials and infrastructure.

If the financial-export and operational-logistical dimensions show the extent to which the clusters are able to maintain export volumes and ensure physical delivery of products, then, for further comparative analysis, it is essential to evaluate the quality of their market presence. The marketing dimension of resilience reflects whether exports rely on a raw-material model or on higher value-added products, and how developed branding, sales channels, and geographical diversification are.

Accordingly, the next step is to calculate the marketing sub-index I\_M for the three clusters (Table 7), based on the assessment of the share of high value-added products, the level of marketing instruments, and the diversification of sales markets. The final values are then aggregated into the integrated indicator I\_M.

Table 7. System of indicators for constructing the integrated resilience index of clusters. Marketing dimension (I\_M)

| Code | Indicator   | Scale   | Agri-food   | Furniture                             | Mechanical engineering + electrical equipment |
|------|---|---|---|---------------------------------------|---|
| M1   | Share of high value-added products in the cluster's exports | 1 – predominantly raw materials;<br>2 – mixed;<br>3 – predominantly finished products | 2 (large share of raw materials, but the share of finished food products is increasing) | 3 (almost entirely finished products) | 3 (finished industrial products)              |

| Code | Indicator                               | Scale   | Agri-food  | Furniture  | Mechanical engineering + electrical equipment         |
|------|---|---|--|--|---|
| M2   | Level of branding/marketing instruments | 1 – minimal;<br>2 – basic;<br>3 – advanced  | 2 (branding in processing, weak in raw materials)    | 3 (design, brands, trade fairs, online presence) | 2 (targeted B2B marketing, limited public visibility) |
| M3   | Diversification of sales markets        | 1 – high concentration in 1–2 markets;<br>2 – medium;<br>3 – high diversification | 2 (concentrated, but the war forced diversification) | 3 (broad presence in EU countries)               | 2 (limited set of markets, often 2–3 key partners)    |

To obtain a comparable assessment of marketing resilience for each cluster, the qualitative scores for indicators M1–M3 should be aggregated into a single final sub-index  $I_M$ . This makes it possible to move from analysing individual characteristics (export structure, level of branding, market diversification) to an integrated assessment of each cluster's marketing adaptability. The aggregated results are presented in Table 8.

Table 8. Final sub-index  $I_M$ . Marketing dimension ( $I_M$ )

| Cluster                                       | M1 | M2 | M3 | $I_M$ |
|---|----|----|----|-------|
| Agri-food                                     | 2  | 2  | 2  | 2,00  |
| Furniture                                     | 3  | 3  | 3  | 3,00  |
| Mechanical engineering + electrical equipment | 3  | 2  | 2  | 2,33  |

Table 8 reflects the marketing adaptability of the clusters through three indicators: the share of high value-added products (M1), the level of branding and marketing instruments (M2), and diversification of sales markets (M3).

The obtained values are as follows:

- The agri-food cluster has  $I_M = 2.00$ , a medium level. On the one hand, raw materials still constitute a significant share of its exports ( $M1 = 2$ ), and branding and advanced marketing instruments are developed mainly in the processing segment but remain weak in raw-material goods ( $M2 = 2$ ). Market diversification improved under wartime conditions, yet concentration in several key importer markets persists ( $M3 = 2$ ). This indicates a transitional state: marketing adaptation has begun, but its potential is far from fully realised.

- The furniture cluster demonstrates the maximum value,  $I_M = 3.00$ . Furniture is entirely finished, high value-added production ( $M1 = 3$ ), where design, branding, participation in trade fairs, and digital channels form the foundation of competitiveness ( $M2 = 3$ ). Sales markets are diversified across EU countries ( $M3 = 3$ ). Therefore, the resilience of this cluster is largely based on strong marketing adaptability.

- The products are high-tech and finished ( $M1 = 3$ ), but branding and marketing are mostly limited to B2B sales and participation in exhibitions, with limited public visibility ( $M2 = 2$ ). Market diversification is restricted to a small circle of key partners ( $M3 = 2$ ). This means that the marketing potential is high due to the nature of the product but only partially realised.

Thus, the analysis of Table 8 confirms that the furniture cluster is the strongest in terms of marketing adaptation, the agri-food cluster is in a transition from a raw-material model to branded products, and mechanical engineering has significant but not yet fully utilised marketing potential.

The assessment of the marketing dimension of resilience shows the extent to which clusters are able to use market instruments to maintain and grow exports, but it does not account for the “infrastructure” on which this resilience relies. An important complement to the financial, operational-logistical, and marketing analysis is the institutional-organizational dimension, which reflects the presence of industry associations, clusters, export alliances, and access to government and donor support programmes. These factors determine how systematically the clusters are integrated into export development policy and whether they have the institutional “backing” needed to implement resilience strategies and marketing adaptation. The set of corresponding indicators and their scaling are presented in Table 9.

Table 9. System of indicators for constructing the integrated resilience index of clusters. Institutional-organizational dimension (I\_U)

| Code | Indicator   | Scale  | Agri-food  | Furniture  | Mechanical engineering + electrical equipment                                |
|------|---|--|--|--|--|
| U1   | Presence of industry associations, clusters, export alliances | 1 – fragmented;<br>2 – present but weak;<br>3 – well developed | 3 (strong agricultural associations and business organisations)      | 2 (regional furniture clusters and associations) | 2 (sectoral associations exist but are weakly integrated into export policy) |
| U2   | Access to government/donor export support programmes          | 1 – occasional;<br>2 – partial;<br>3 – systematic              | 3 (the agricultural sector is one of the main recipients of support) | 2 (programmes exist, but coverage is limited)    | 2 (project-based, targeted support)  |

Given that indicators U1 and U2 capture different but interrelated aspects of the institutional-organizational environment, it is appropriate to consolidate them into a single integrated measure, the sub-index I\_U, for further comparison. This allows for an assessment of the overall level of institutional support for each cluster in a summarised form and enables cross-cluster comparison. The aggregated scores of the institutional-organizational dimension of resilience for the three clusters are presented in Table 10.

Table 10. Final sub-index I\_U. Institutional-organizational dimension (I\_U)

| Cluster                                       | U1 | U2 | I_U  |
|---|----|----|------|
| Agri-food                                     | 3  | 3  | 3,00 |
| Furniture                                     | 2  | 2  | 2,00 |
| Mechanical engineering + electrical equipment | 2  | 2  | 2,00 |

Table 10 characterises institutional-organizational resilience through two indicators: the presence of industry associations and clusters (U1), and access to government/donor export support programmes (U2). The results show:

– The agri-food cluster has the maximum value,  $I_U = 3.00$ . This sector has strong professional and business associations ( $U1 = 3$ ), together with active export support, credit, and grant initiatives ( $U2 = 3$ ). The institutional environment is one of the key factors supporting the resilience of agricultural exports.

– The furniture cluster has  $I_U = 2.00$ . Regional furniture clusters and associations exist ( $U1 = 2$ ), but their capacities and resource base are significantly smaller than in the agri-food sector; access to support programmes exists, but coverage is limited ( $U2 = 2$ ). This indicates that the cluster has organizational potential, but it requires strengthening, especially at the national level.

– Mechanical engineering and electrical equipment also have  $I_U = 2.00$ : sectoral organisations exist but are less systematically integrated into export and industrial policy ( $U1 = 2$ ), and support is mostly project-based and targeted ( $U2 = 2$ ). An institutional foundation is present, but it does not provide as strong a “supporting base” as in the agri-food sector.

Thus, Table 10 shows that institutional and organizational conditions are most favourable for the agri-food cluster, while the furniture and machinery clusters operate under limited but existing support, which can be strengthened through cluster initiatives and better integration into export development policy.

The step-by-step construction of the sub-indices  $I_F$ ,  $I_O$ ,  $I_M$ , and  $I_U$  has made it possible to break down the resilience of the three clusters into separate dimensions; to demonstrate that high financial weight (as in the agri-food sector) does not automatically guarantee high operational or marketing resilience; to identify clusters where marketing adaptation is already a key source of resilience (furniture industry) and those where marketing still represents an underused reserve (mechanical engineering, and partly agri-processing).

At the next stage, based on the values of the sub-indices, it becomes possible to calculate the integrated resilience index for each cluster and proceed to a comparative analysis of resilience strategies and marketing adaptation, as well as to develop targeted recommendations within the crisis-planning model.

To move from a component-by-component assessment of resilience to an overall ranking of the clusters, the sub-indices  $I_F$ ,  $I_O$ ,  $I_M$ , and  $I_U$  should be aggregated into a single Integrated Resilience Index (IIS). This makes it possible to quantitatively compare the level of resilience across the three clusters, taking into account not only financial performance but also operational, marketing, and institutional components. In line with the logic of the study, the marketing component is assigned a slightly higher weight compared to the other dimensions (0.30 vs. 0.25 and 0.20), reflecting the focus on marketing adaptation strategies as a key resilience factor under wartime conditions. The aggregated results of calculating the integrated resilience index for the three clusters are presented in Table 11. The applied weights are:  $w_F = 0,25$ ;  $w_O = 0,25$ ;  $w_M = 0,30$ ;  $w_U = 0,20$ . The sub-indices are measured on a scale from 1 (low) to 3 (high).

$$IIS=0,25I_F+0,25I_O+0,30I_M+0,20I_U$$

Table 11. Calculation of the Integrated Resilience Index of the clusters

| Cluster                                       | I_F  | I_O  | I_M  | I_U  | IIS calculation   | IIS (approx., 1–3) |
|---|------|------|------|------|---|--------------------|
| Agri-food                                     | 2,67 | 1,50 | 2,00 | 3,00 | $0,25 \cdot 2,67 + 0,25 \cdot 1,5 + 0,30 \cdot 2,0 + 0,20 \cdot 3,0$  | $\approx 2,24$     |
| Furniture                                     | 1,67 | 3,00 | 3,00 | 2,00 | $0,25 \cdot 1,67 + 0,25 \cdot 3,0 + 0,30 \cdot 3,0 + 0,20 \cdot 2,0$  | $\approx 2,47$     |
| Mechanical engineering + electrical equipment | 1,67 | 2,00 | 2,33 | 2,00 | $0,25 \cdot 1,67 + 0,25 \cdot 2,0 + 0,30 \cdot 2,33 + 0,20 \cdot 2,0$ | $\approx 2,02$     |

The analysis of the obtained IIS values (Table 11) shows that the highest integrated level of resilience is demonstrated by the furniture cluster ( $\approx 2.47$  on a 1–3 scale). This outcome is driven not by scale (which is comparatively small) but by a combination of a strong marketing dimension ( $I_M = 3.00$ ) and high operational-logistical flexibility ( $I_O = 3.00$ ). In other words, the resilience of the furniture industry is based on finished, high value-added products, developed branding, diversified sales channels, and the ability to adapt production and logistics relatively quickly to environmental changes.

The agri-food cluster has a somewhat lower, but still high, integrated resilience score ( $\approx 2.24$ ). Its strengths lie in the financial-export component ( $I_F = 2.67$ ; dominant share in total exports) and institutional-organizational support ( $I_U = 3.00$ ; developed associations, available support programmes). At the same time, the overall index is held back by lower operational-logistical resilience ( $I_O = 1.50$ ) and a moderate level of marketing adaptation ( $I_M = 2.00$ ), linked to the high share of raw-material exports and the geographic dependence of processing capacities. This confirms that even with high financial weight, the cluster requires further strengthening specifically in logistics diversification and development of branded, value-added products.

Mechanical engineering and electrical equipment show the lowest integrated resilience index ( $\approx 2.02$ ), reflecting a combination of a weakened financial position ( $I_F = 1.67$ , due to declining exports) and moderate operational resilience ( $I_O = 2.00$ ). At the same time, the values of the marketing and institutional sub-indices ( $I_M = 2.33$ ;  $I_U = 2.00$ ) indicate that the cluster has substantial but only partially realised potential, both in B2B marketing and integration into global value chains, and in terms of institutional support and cooperation.

Overall, the relatively narrow range of IIS values (from  $\approx 2.02$  to  $\approx 2.47$ ) indicates that all three clusters are positioned within a medium-resilience zone, but with different structures of strengths and weaknesses. The furniture cluster represents a case of “marketing-operational” resilience under conditions of limited scale; the agri-food cluster illustrates “financial-institutional” resilience that requires strengthening in marketing and logistics; while mechanical engineering and electrical equipment demonstrate “strategic-potential-based” resilience, constrained by current financial and operational challenges. This forms the basis for further comparative analysis of their resilience strategies and for developing differentiated recommendations within the crisis-planning model.

The obtained values of the integrated resilience index (Table 11) not only allow the clusters to be ranked by their level of resilience but also reveal qualitatively distinct resilience profiles: “marketing-operational” (furniture), “financial-institutional” (agri-food cluster), and resilience grounded in unrealised strategic potential (mechanical engineering

and electrical equipment). The logical next step is to formulate differentiated, targeted directions for marketing adaptation for each cluster, summarised in Table 12.

Table 12. Target directions of marketing adaptation in international markets for the three clusters

| Cluster                                       | Strategic goal of marketing adaptation  | Key tasks (summary)  | Priority instruments/directions  |
|---|---|--|--|
| Agri-food (processing + finished products)    | Transition from a raw-material model to increasing the share of finished food products in exports; market diversification | <ul style="list-style-type: none"> <li>– increase the share of exported finished products (meat, dairy, sugar/confectionery, processed foods);</li> <li>– strengthen positions in EU, MENA, and Asian markets;</li> <li>– reduce dependence on a small number of importer countries</li> </ul>                 | <ul style="list-style-type: none"> <li>– branding and positioning of Ukrainian food products (quality, safety, traceability);</li> <li>– certification (HACCP, EU standards) as a marketing argument;</li> <li>– cooperation with international retailers and HoReCa (private label, co-branding);</li> <li>– participation in specialised trade fairs (SIAL, Anuga, etc.);</li> <li>– use of B2B platforms for distributor search</li> </ul>                    |
| Furniture industry                            | Consolidate and expand presence in the EU market as a producer of high value-added furniture                              | <ul style="list-style-type: none"> <li>– strengthen the recognition of Ukrainian furniture brands;</li> <li>– diversify sales channels (retail chains, stores, online platforms);</li> <li>– increase the share of products with eco-design and sustainability certifications</li> </ul>                       | <ul style="list-style-type: none"> <li>– design-centred marketing (collections, visual identity, showrooms, participation in trade fairs);</li> <li>– work with marketplaces and online catalogues, 3D/VR presentations;</li> <li>– cluster projects: joint showrooms/warehouses in the EU, joint branding initiatives;</li> <li>– ESG communication (environmental friendliness, social responsibility, “made in Ukraine” as a resilience attribute)</li> </ul> |
| Mechanical engineering + electrical equipment | Integration into European and global value chains and transition toward “equipment engineering + service” solutions.      | <ul style="list-style-type: none"> <li>– maintain and expand exports in reconstruction-related niches (energy, transport, construction, agriculture);</li> <li>– strengthen the visibility of Ukrainian producers in B2B markets;</li> <li>– ensure compliance with the standards of target markets</li> </ul> | <ul style="list-style-type: none"> <li>– B2B marketing: industry exhibitions, business missions, technical presentations;</li> <li>– obtaining and demonstrating certifications (CE, ISO, sector-specific standards);</li> <li>– developing partnerships with European integrators (joint projects, co-branding);</li> <li>– technical online catalogues, solution configurators, specialised digital platforms</li> </ul>                                       |

Table 12 summarises the results of the integrated index analysis and translates them into differentiated target directions of marketing adaptation for each cluster, serving as a transitional link between the analytical part of the study and the block of practical recommendations.

The synthesis presented in Table 12 shows that:

- for the agri-food cluster, the key challenge is the transition from a raw-material model to increasing the share of processed food products in exports, which directly corresponds to the identified imbalance between high financial resilience and a medium level of the marketing sub-index;

- for the furniture industry, the priority is to scale up its existing strengths – strengthening branding, omnichannel presence, and cluster cooperation in the EU market, which aligns with the highest values of the marketing and operational sub-indices;
- for mechanical engineering and electrical equipment, the primary directions include integration into European value chains, development of B2B marketing, and certification, which should compensate for relatively low financial-export resilience by activating the sector’s strategic potential.

Thus, Table 12 effectively “closes” the empirical part of the study by demonstrating how the results of the integrated index analysis (Tables 1–11) are directly transformed into practical managerial guidelines for the three selected clusters.

The recommendations formulated in this study are clearly cluster-differentiated in nature.

For the agri-food cluster, the practical steps focus on:

- increasing the share of exported processed food products (meat, dairy products, confectionery, products of deep processing);
- diversifying export markets (reducing dependence on a limited group of importers through stronger presence in the EU, MENA, and Asian markets);
- strengthening branding and the positioning of Ukrainian products (quality, safety, traceability), and using certification as an element of marketing communication;
- systematic cooperation with international retailers, HoReCa, and B2B platforms.

This directly corresponds to the resilience profile identified in the study: strong financial and institutional positions, but “bottlenecks” in logistics and marketing.

For the furniture cluster, the recommendations are aimed at:

- scaling up brand and design development (participation in trade fairs, development of proprietary collections, strengthening visual presence in EU markets);
- expanding omnichannel sales (retail chains, showrooms, online platforms, marketplaces, 3D/VR product presentations);
- enhancing cluster-based cooperation (joint showrooms, warehouse hubs, joint marketing initiatives in the EU);
- integrating sustainability and ESG components into market positioning (“eco-design,” responsible production).

In this way, the furniture cluster, which has already demonstrated the highest integrated resilience index, receives a foundation for further growth without losing its competitive advantages.

For mechanical engineering + electrical equipment, the recommendations focus on:

- strengthening B2B marketing (industry exhibitions, business missions, technical presentations, demonstration projects);
- developing integrated solutions of the “equipment + engineering + service” type, which increases the share of added value and consolidates long-term partnerships;

- obtaining and actively leveraging international certifications (CE, ISO, industry-specific standards) as an element of trust and market access;
- expanding partnerships with European integrators and participating in post-war reconstruction projects.

This corresponds to the identified profile: comparatively weak current financial and operational indicators, but high technological potential and the ability to strengthen resilience through marketing and cooperation components.

Summarising the results of the integrated assessment of the resilience of the three export-oriented clusters and the differentiated directions of marketing adaptation derived from it, it can be stated that the empirical objectives of the study have been fully achieved. The constructed integrated resilience index model has demonstrated its practical applicability, while the cluster analysis has made it possible to identify distinct resilience profiles and corresponding managerial priorities. This provides the basis for formulating the study's general conclusions and outlining avenues for further research.

#### 4. Conclusion

In conclusion, the study substantiated and applied an integrated methodology for assessing the resilience of export-oriented clusters, combining four interrelated dimensions: financial-export, operational-logistical, marketing, and institutional-organisational. This approach made it possible to move beyond the analysis of isolated indicators and shift to a holistic assessment of cluster resilience under the conditions of the full-scale war in Ukraine. The methodology was tested on three key clusters of the Ukrainian economy, the agri-food cluster (processing and raw materials), the furniture industry, and mechanical engineering + electrical equipment, taking into account the dynamics of 2022–2024, which enabled the calculation of resilience sub-indices and the integrated index for each cluster.

The obtained results demonstrate that the resilience of export-oriented clusters has a heterogeneous structure. The agri-food cluster forms a predominantly financial-institutional model of resilience: it ensures a dominant share of export revenues and relies on a well-developed system of sectoral associations and support programmes, yet remains vulnerable due to logistical constraints and the raw-material nature of a substantial part of its exports. The furniture industry, by contrast, exhibits resilience based on marketing and operational factors: the production of finished goods with high added value, orientation towards EU markets, manufacturing flexibility, and advanced design and branding practices have enabled this cluster to achieve the highest integrated resilience index. Mechanical engineering + electrical equipment is characterised by comparatively weaker current financial-export and operational indicators, yet it retains significant technological and marketing potential that can be realised through strengthened B2B marketing, participation in European value chains, and enhanced institutional support.

A key finding of the study is that marketing adaptation is not a secondary, but a system-shaping component of resilience. It is precisely the differences within the marketing dimension, product structure, branding maturity, and market diversification that explain why clusters with a similar overall level of resilience demonstrate different adaptive capacities under prolonged crisis conditions. Based on the integrated resilience index and

the identified resilience profiles, cluster-specific directions of marketing adaptation were formulated and summarised in Table 12. For the agri-food cluster, these include, above all, increasing the share of finished food products and diversifying markets; for the furniture industry, scaling branding, omnichannel presence, and cluster cooperation; and for mechanical engineering + electrical equipment, advancing B2B marketing, certification, and integration into reconstruction-related projects.

The practical significance of the obtained results lies in their potential to serve as a reference point both for public authorities and for businesses. For national and regional policy, the integrated index and the structure of its sub-indices make it possible to more accurately determine which support instruments should be prioritised for each cluster, development of logistics infrastructure, strengthening of export marketing, or support for clustering and sectoral associations. For companies, the proposed approach enables clearer identification of the specific dimensions in which their own resilience is insufficient and where managerial efforts should be concentrated, financial, operational, marketing, or institutional.

At the same time, the conducted analysis opens several directions for further research. A logical next step is the disaggregation of the integrated resilience index at the level of individual enterprises within each cluster and the empirical testing of the crisis-planning model on specific company cases. Another promising direction is the application of the methodology to additional sectors of the economy, such as IT services, pharmaceuticals, and creative industries, to compare resilience profiles of industries with different value-added structures. Dynamic modelling of resilience over a longer time horizon, including the post-war period and the reconstruction phase, also acquires particular importance, as it would allow accounting for changes in external market conditions, logistics environments, and modes of access to international markets.

## References

- Duchek, S. (2020). Organizational resilience: A capability-based conceptualization. *Business Research*, 13(1), 215–246. DOI: 10.1007/s40685-019-0085-7
- Hillmann, J., & Guenther, E. (2021). Organizational Resilience: A Valuable Construct for Management Research? *International Journal of Management Reviews*, 23(1), 7–44. DOI: 10.1111/ijmr.12239
- Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4–30.
- Rose, A. (2004). Defining and Measuring Economic Resilience to Disasters. *Disaster Prevention and Management*, 13(4), 307–314. DOI: 10.1108/09653560410556528.
- Somers, S. (2009). Measuring Resilience Potential: An Adaptive Strategy for Organizational Crisis Planning. *Journal of Contingencies and Crisis Management*, 17(1), 12–23. DOI: 10.1111/j.1468-5973.2009.00558.x
- S.C. Lenny Koh, Karthik Suresh, Peter Ralph, Michelle Saccone. Quantifying organisational resilience: an integrated resource efficiency view. Pages 5737-5756 | Received 22 May 2023, Accepted 30 Nov 2023, Published online: 20 Dec 2023. <https://doi.org/10.1080/00207543.2023.2296018>
- Chen, R., Xie, Y., & Liu, Y. (2021). Defining, Conceptualizing, and Measuring Organizational Resilience: A Multiple Case Study. *Sustainability*, 13(5), 2517. DOI: 10.3390/su13052517
- Lihonenko, L. O. (2016). Anti-Crisis Management of the Enterprise in the Conditions of the Knowledge Economy and the Intellectualization of Management. *Economic Forum*, 1, 161–170. URL: [http://nbuv.gov.ua/UJRN/ecfor\\_2016\\_1\\_25](http://nbuv.gov.ua/UJRN/ecfor_2016_1_25).

- A.P.Alegre de Almeida (2024). From Crisis to Opportunity: A Strategic Approach to Crisis Management in Contemporary Organizations. Vol. 1 No. 1: RCMOS – Multidisciplinary Scientific Journal O Saber. <https://doi.org/10.51473/rcmos.v1i1.2024.951>
- Dinh, H. T. T. (2024). Constructing a Resilience Measurement Model for Small and Medium-Sized Enterprises in Vietnam: A PLS-SEM Approach. *Journal of Eastern European and Central Asian Research (JEECAR)*.
- Nguyen, D., Nguyen, T., Nguyen, T., Nguyen, X., Do, T., & Ngo, H. (2022). The Effect of Supply Chain Finance on Supply Chain Risk, Supply Chain Risk Resilience, and Performance of Vietnam SMEs in Global Supply Chain. *Uncertain Supply Chain Management*, 10(1), 225–238.
- Whiteshield. (2024). Global Labour Resilience Index 2024: A Call for Climate-Friendly Labour Markets. Whiteshield, Dubai–London. (Official GLRI 2024 Report).
- Universal Postal Union (UPU). (2016). Integrated Index for Postal Development (ZIPD): 2016 Results. Bern: UPU.
- Grice, R. (2023). Shellfish Aquaculture Resilience Index: A Self-Assessment. Mississippi–Alabama Sea Grant / Auburn University, in the workshop materials «Risk Assessment and Management for Shellfish Growers».
- Rose, A. (2014). Measuring Economic Resilience to Disasters: An Overview. V: IRGC Resource Guide on Resilience (policy brief).
- Dubbelink, S. I., Herrando, C., & Constantinides, E. (2021). Social Media Marketing as a Branding Strategy in Extraordinary Times: Lessons from the COVID-19 Pandemic. *Sustainability*, 13(18), 10310. DOI: 10.3390/su131810310.
- Hoekstra, J. C., & Leeftang, P. S. H. (2020). Marketing in the Era of COVID-19. *Italian Journal of Marketing*, 2020, 249–260. DOI: 10.1007/s43039-020-00016-3.
- Bahorka, M. (2022). The Place of Marketing Activities in the Crisis Management of the Enterprise. *Three Seas Economic Journal*, 3(3).
- Kanumuri, V. V. (2025). Crisis Marketing Strategies for Economic Recessions. *International Journal of Multidisciplinary Studies and Recent Research*.
- Vytvytska, O., Suvorova, S., & Koriuhin, A. (2022). The Impact of Digital Marketing on the Development of Entrepreneurship in Wartime Conditions. *Economy and Society*, 40. DOI: 10.32782/2524-0072/2022-40-66.
- Nemudra, O. V. (2023). Adaptive Marketing Management in Conditions of Uncertainty and Wartime. In: Proceedings of the Conference “Organizational Management: Modern Concepts and Development Models” (Igor Sikorsky Kyiv Polytechnic Institute).
- Burkovska, A. I., & Dubeniuk, Ya. O. (2024). Marketing Strategy as an Element of Enterprise Management in Wartime. *Modern Economics*.
- Vytvytska, O. M., Suvorova, S. H., & Koriuhin, A. V. (2023). The Impact of Digital Marketing on Increasing Enterprise Competitiveness in Wartime Conditions.
- Tanasiichuk, A., Dybchuk, L., Shevchuk, A., Hromova, O., Mykhailo, H., Zakharchuk, I., & Ulianych, Y. (2025). International Marketing Diversification: A Path to Sustainable Enterprise Development. *European Journal of Sustainable Development*, 14(1), 266. <https://doi.org/10.14207/ejsd.2025.v14n1p266>
- Global economy. URL: [https://www.theglobaleconomy.com/Ukraine/gdp\\_current\\_local\\_currency/](https://www.theglobaleconomy.com/Ukraine/gdp_current_local_currency/).
- State Statistics Service of Ukraine. URL: <https://www.ukrstat.gov.ua/>
- Trade statistics for international business development. URL: <http://www.trademap.org>.
- Kovinko O. M. (2017) Marketing in the conditions of international diversification of business activity: monograph. K.: KNEU, 423 p.
- Tanasiichuk, A., Tyukhtenko, N., Zburmekha, Y., Sokoliuk, S., Prokopchuk, O., Krupskiy, A., & Tsurkanov, M. (2024). Sustainable Development Strategy of Enterprises in International Markets: Opportunities and Challenges. *European Journal of Sustainable Development*, 13(3), 311. <https://doi.org/10.14207/ejsd.2024.v13n3p311>
- Tanasiichuk, A., Kovalchuk S., Sokoliuk K., Sokoliuk S., Liubokhynets L., Sirenko S. Innovative Methods of Assessing the Efficiency of Internet Communications of Enterprises. *European Journal of Sustainable Development*. 2022. Volume 11 No 2, p.15–31. <https://doi.org/10.14207/ejsd.2022.v11n2p15>

- Tanasüchuk, A., Kovalchuk S., Ivanchenkova L., Hromova O., Havenko M., Shevchuk A. Digital Technologies in the Process of Forming Sustainable Strategies for Agricultural Enterprises in International Markets. *European Journal of Sustainable Development*, 2024. 13(1), 321. <https://doi.org/10.14207/ejsd.2024.v13n1p321>
- Tanasüchuk, A., Mykhailshyn L., Fedoryshyna L., Lagodiienko V., Tetyana R., Polyova N., Yurchenko O. Strategies for Sustainable Development of Companies in International Markets in the context of Digitalization. *European Journal of Sustainable Development*, (2024). 13(2), 12. <https://doi.org/10.14207/ejsd.2024.v13n2p12>