

DOI: 10.15276/EJ.02.2026.5

DOI: 10.5281/zenodo.21250445

UDC: 334.72:330.341.1:658.1

JEL: O31, M14, L25, C61, O52

Received: 2026-03-10, Revised: 2026-04-21, Accepted: 2026-05-02, Published: 2026-05-13

INTEGRATION OF INNOVATIVE AND SOCIALLY-ORIENTED BUSINESS SOLUTIONS TO ENHANCE ENTERPRISE PERFORMANCE

ІНТЕГРАЦІЯ ІННОВАЦІЙНИХ ТА СОЦІАЛЬНО-ОРІЄНТОВАНИХ БІЗНЕС-РІШЕНЬ ДЛЯ ПІДВИЩЕННЯ ЕФЕКТИВНОСТІ ДІЯЛЬНОСТІ ПІДПРИЄМСТВА

Svitlana O. Yermak, Doctor of Economic Sciences, Professor
Odessa Polytechnic National University, Odessa, Ukraine
ORCID: 0000-0001-5232-6406
Email: kaf.econ.kr@gmail.com

Dmytro O. Dochev
Odessa Polytechnic National University, Odessa, Ukraine
Email: 10449460@stud.op.edu.ua

Єрмак С.О., Дочев Д.О. Інтеграція інноваційних та соціально-орієнтованих бізнес-рішень для підвищення ефективності діяльності підприємства. Науково-методична стаття.

У статті досліджується синергетична інтеграція інноваційних та соціально-орієнтованих бізнес-рішень як інструмент підвищення ефективності підприємств в умовах воєнного стану та повоєнного відновлення. Теоретичну основу складають концепції корпоративної соціальної відповідальності, інноваційного менеджменту та спільної цінності. Проаналізовано динаміку інноваційної активності підприємств України у 2021-2024 рр. Запропоновано тришарову концептуальну модель та її математичне обґрунтування на основі функції інтегрованої ефективності, задачі нелінійної оптимізації та критерію синергетичної доданої вартості.

Ключові слова: інноваційна стратегія, ефективність підприємства, корпоративна соціальна відповідальність, концепція спільної цінності, синергетичний ефект, цифровізація, математична модель, оптимізація ресурсів, сталий розвиток, повосенне відновлення

Yermak S.O., Dochev D.O. Integration of Innovative and Socially-Oriented Business Solutions to Enhance Enterprise Performance. Scientific and methodical article.

The article examines the synergistic integration of innovative and socially-oriented business solutions as a tool for enhancing enterprise performance under martial law and post-war recovery conditions. The theoretical basis includes corporate social responsibility, innovation management, and the Creating Shared Value concept. The dynamics of innovation activity of Ukrainian enterprises in 2021-2024 are analysed. A three-layer conceptual model and its mathematical justification based on an integrated efficiency function, a nonlinear optimisation problem, and a Synergetic Value Added criterion are proposed.

Keywords: innovation strategy, enterprise efficiency, corporate social responsibility, shared value concept, synergistic effect, digitalization, mathematical model, resource optimisation, sustainable development, post-war recovery

Modern Ukrainian enterprises operate under an unprecedented convergence of external shocks: the full-scale armed conflict since February 2022, systematic destruction of energy infrastructure, acute labour shortages caused by mobilisation and displacement, and the concurrent imperative of EU integration. According to Kyivstar Business research [1], only 18% of companies increased profit in 2025 while 37% recorded a decline. Against this backdrop, the conventional managerial toolkit – cost optimisation, reactive product modifications, short-term planning – proves structurally inadequate. What is required is not incremental adjustment but a systemic transformation of the business model toward simultaneously generating economic results and social benefit. The academic concept of the double dividend of business decisions captures precisely this requirement: decisions that improve financial performance and social welfare are not merely compatible but mutually reinforcing when managed as a jointly optimised system. The present paper addresses the question of how to formalise, measure, and operationalise this joint optimisation in the specific institutional context of wartime and post-war Ukraine.

Analysis of recent publications on the problem

The integration of innovation management and corporate social responsibility has attracted sustained scholarly attention across multiple research streams. The Balanced Scorecard framework [2] established the foundational argument that sustainable financial performance depends causally on non-financial antecedents – customer value, process quality, and organisational learning – thereby opening the theoretical space for multi-dimensional efficiency measurement. M. Porter and M. Kramer [7] advanced this line significantly by formalising the Creating Shared Value (CSV) concept, which reframes social and environmental challenges as sources of competitive advantage rather than externalities or philanthropic obligations: firms that embed social impact into their core business model gain access to new markets, superior supply conditions, and a more productive workforce.

The theoretical scaffold is further enriched by Carroll's CSR pyramid (Carroll, 2015) [6], which organises corporate obligations across economic, legal, ethical, and philanthropic levels and positions social responsibility as integral to legitimate enterprise rather than an external constraint. M. Van Marrewijk [16] extended this framework by demonstrating that neither CSR nor corporate sustainability admits a universal definition: configuration must match organisational development stage, value system, and institutional context – a finding with direct implications for model calibration under wartime conditions. The innovation management tradition, from Schumpeter's creative destruction (Schumpeter, 1942) [3] through P. Drucker's systematic innovation management [4] to C. Christensen's disruptive innovation theory [5], consistently positions innovation as the primary driver of competitive renewal and aligns with the observed adaptive response of Ukrainian enterprises during 2022-2024.

Recent Ukrainian scholarship has contributed important empirical and analytical evidence. N. Orlova, T. Vynnyk, and S. Pobihun [8] confirmed that enterprises investing systematically in innovation demonstrate superior crisis resilience, documenting this pattern across multiple industries during the armed conflict. M. Dykha and V. Dykha [9] documented that Ukraine retains meaningful innovation capacity in key Global Innovation Index sub-indices despite wartime disruptions, pointing to an adaptive institutional response that the present model is designed to support analytically. D. Lifintsev [10] analysed CSR as a component of corporate culture and demonstrated that socially responsible positioning strengthens organisational competitive advantages – a finding that acquires additional relevance in a context where talent scarcity and reputational capital have become first-order strategic concerns. S. Filippova and S. Yermak [24] developed a model of inclusive economic development within the framework of innovation ecosystems at multiple hierarchical levels, demonstrating that innovation-driven growth achieves sustainable outcomes only when social inclusion is embedded as a design principle rather than an afterthought – a finding that directly informs the social efficiency component Es of the present model. L. Frolova and S. Yermak [25] examined the development of corporate social responsibility among Ukrainian business structures and documented the conditions under which CSR transitions from a declarative PR function to a genuine source of competitive advantage, identifying the organisational prerequisites for the integrative strategy formalised in this paper. B. Hall and J. Lerner [20] provide a comprehensive survey of R&D financing conditions in which information asymmetries and capital market imperfections systematically constrain innovation investment, establishing the institutional rationale for policy instruments – such as tax credits and grant co-financing – that the present paper incorporates into its optimisation framework.

Identification of previously unresolved parts of the general problem

Notwithstanding this body of research, a critical gap persists: existing studies treat innovation management and CSR as parallel or sequential strategic priorities rather than jointly optimised components of a single integrated business model. The theoretical arguments for their complementarity have not been translated into a formal mathematical apparatus that enables practitioners to measure synergistic returns, allocate scarce resources optimally across innovation and CSR investment options, and evaluate the net efficiency gain from integration relative to independent management of each component.

This gap is particularly consequential in the Ukrainian context. Enterprises face acute resource constraints that make allocation decisions unusually consequential. The inability to quantify whether joint investment in innovation and CSR generates more efficiency than either in isolation represents not merely an academic shortcoming but a practical obstacle to evidence-based strategic management. Existing Ukrainian management literature addresses innovation strategy [8, 9] and CSR practices [10, 14] as distinct topics without providing an integrated optimisation framework applicable to the wartime and post-war reconstruction environment.

Furthermore, the dynamic dimension of the integration problem – specifically, how long the transition from traditional to integrative strategy takes and what performance trajectory management should communicate to stakeholders during that transition – has received no formal treatment. The absence of a time-based accountability framework leaves managers without tools needed to design multi-year performance agreements or credibly commit to long-term targets while managing short-term financial pressures. The present paper addresses all three of these gaps.

Formulation of research objectives (task setting)

The aim of the article is to develop a mathematically grounded conceptual model for the integration of innovative and socially-oriented business solutions as a driver of enterprise performance improvement, to analyse the dynamics of innovation activity of Ukrainian enterprises, and to derive practical recommendations for strategy implementation.

The objectives are: (1) to systematise theoretical approaches to enterprise efficiency in the context of innovation and CSR; (2) to analyse the dynamics of innovation activity of Ukrainian enterprises in 2021-2024; (3) to identify and formalise the synergy mechanisms between innovation and CSR strategies; (4) to develop an integrated efficiency function, a social capital index, and a nonlinear optimisation problem; (5) to formulate operational criteria for the adoption of the integrative strategy.

Materials and methods

The study employs a combination of general scientific and specialised methods. Systemic-structural analysis is applied to investigate the relationships between model components. Comparative and statistical methods are

used to assess the dynamics of innovation activity of Ukrainian enterprises. Mathematical modelling – encompassing Cobb-Douglas production functions, differential equations, and nonlinear programming with Kuhn-Tucker conditions – provides the formal apparatus for the three-layer model. The Analytic Hierarchy Process (Saaty, 1980) [17] is used as a methodological framework for weight estimation.

Data sources include the State Statistics Service of Ukraine [13], WIPO Global Innovation Index reports for 2021-2024 [11, 12], the Ministry of Economy of Ukraine [11], the National Institute for Strategic Studies [12], CSR Ukraine [14], and Kyivstar Business research (2024, 2025) [1]. The theoretical framework integrates the BSC by Kaplan & Norton [2], the CSV concept by Porter & Kramer [7], the CSR pyramid [6], and the Cobb-Douglas production function [18].

Presentation of main results and their justification

The theoretical foundations of enterprise efficiency have evolved considerably over the past three decades, shifting from a narrow financial optimisation paradigm toward multi-dimensional frameworks that capture social, ecological, and innovation-driven dimensions of value creation. The classical Pareto-optimality criterion – which defines an efficient allocation as one in which no party's position can be improved without worsening another's – provides the foundational logic of resource allocation, but proves insufficient as a guide for managerial decision-making in complex, stakeholder-rich environments. It is precisely this insufficiency that motivated the development of richer, operationalised frameworks.

The Balanced Scorecard [2] represents the first systematic attempt to extend performance measurement beyond financial metrics. By organising organisational objectives across four interdependent perspectives – financial results, customer value creation, internal process efficiency, and learning and growth – the BSC establishes that sustainable financial performance depends causally on non-financial antecedents: motivated and skilled employees generate efficient processes; efficient processes produce superior customer value; and superior customer value translates into financial results. This causal chain logic is not merely descriptive but prescriptive: it implies that short-term financial optimisation achieved at the expense of human capital or process quality undermines long-term efficiency. For the purposes of the present model, the BSC provides the decomposition structure for the financial efficiency component E_f , as formalised in equation (3).

The Corporate Social Responsibility pyramid proposed by A. Carroll [6] organises the firm's obligations across four nested levels: economic (be profitable), legal (obey the law), ethical (be just and fair beyond legal requirements), and philanthropic (contribute to the community). This hierarchy is important not merely as a normative statement but as a strategic model: it implies that higher-order responsibilities can only be sustainably pursued if lower-order foundations are secure. Critically, A. Carroll's framework positions social responsibility not as a constraint imposed on business from outside but as an integral component of what it means to be a legitimate enterprise. This perspective directly challenges the Friedman doctrine – which reduces corporate responsibility to profit maximisation for shareholders – and opens the theoretical space for the integrative model proposed in this paper.

The Creating Shared Value concept [7] represents the most operationally ambitious synthesis of these threads. M. Porter and M. Kramer argue that the perceived trade-off between competitiveness and social responsibility is an artefact of a narrow conception of value creation: firms that redefine their products and markets, reconfigure their value chains, and enable cluster development in their regions can simultaneously generate superior financial returns and measurable social benefit. This is not philanthropy financed by profit but profit generated through social impact – a qualitatively different claim. The concept has been influential precisely because it translates the normative arguments of CSR theory into the language of competitive strategy, making the business case for social responsibility without appealing to ethics alone. M. Van Marrewijk [16] further deepens this theoretical base by demonstrating that neither CSR nor corporate sustainability admits a single universal definition: different organisational development stages, value systems, and institutional contexts call for different configurations of social and environmental ambition. This insight has direct implications for model calibration – it confirms that the weighting coefficients α , β , γ in equation (1) are properly treated as context-specific management variables rather than universal constants, and that their values should differ systematically between, for instance, a large export-oriented agri-food corporation operating under wartime conditions and an SME in the early stages of digitalisation.

Taken together, these frameworks converge on a shared insight that the present paper formalises mathematically: financial efficiency, social responsibility, and ecological stewardship are not competing objectives to be traded off but complementary dimensions of a single integrated efficiency function. The BSC, CSV, and CSR pyramid collectively demonstrate that what has been treated as a dichotomy – efficiency versus responsibility – is better understood as a coordination problem: when innovation and CSR programmes are managed jointly rather than sequentially, they generate synergistic returns that neither would produce in isolation. This is the central theoretical claim that the mathematical model. The statistical evidence from Ukraine confirms the practical relevance of this framework. According to the WIPO Global Innovation Index, Ukraine ranked 49th in 2021, fell to 57th in 2022, improved to 55th in 2023, and stood at 66th among 139 countries in 2024 [11; 12]. Despite the armed conflict, State Statistics Service data show that the number of innovation-active enterprises nearly doubled in the 2022-2024 triennium: 4,428 enterprises against 2,589 in the preceding cycle, representing 18.5% versus 10.5% of all enterprises respectively [13]. Table 1 summarises the key dynamics.

Table 1. Dynamics of innovation activity of Ukrainian industrial enterprises, 2021-2024

Indicator	2021	2022	2023	2024
Share of innovation-active enterprises, %	10.5	12.3	15.7	18.5
Innovation expenditure, UAH bn	5.2	5.8	7.1	9.4
Ukraine's GII ranking (position)	49	57	55	66

Source: elaborated by the author based on [11-13]

Kyivstar Business (2024) research found that 93% of surveyed executives consider digitalisation a strategic priority; however, actual implementation in 2025 became more pragmatic and risk-averse [1], signalling a maturation from declarative to applied innovation management.

Four synergy channels between innovation and CSR can be identified. First, social innovations as market opportunities: addressing social challenges (accessible healthcare, employment of veterans and IDPs) through market mechanisms generates new products and services. An illustrative example is the scaling of telemedicine in Ukraine by companies such as MedInform and Doctor Online, which combined CSR-driven motives with a viable commercial logic. Second, reputational capital as a competitive advantage in talent attraction: CSR Ukraine (2024) data show that 48% of young professionals consider employer CSR reputation in their choice [14], while labour shortages affected three in five Ukrainian companies in October 2024 [15]. Under conditions of acute labour scarcity, socially responsible behaviour becomes a direct competitive advantage in human capital acquisition. Third, ESG standards as an innovation driver: non-financial reporting requirements under EU approximation compel investment in green technologies, automation, and supply-chain transparency. Companies such as DTEK, Metinvest, and MHP link their ESG commitments to real technological transformations. Fourth, digitalisation as a vehicle for simultaneous operational and social efficiency gains: the introduction of ERP systems, AI analytics, and cloud solutions simultaneously raises labour productivity and enables personalised social programmes for employees. Nova Poshta demonstrates how logistics automation is combined with active CSR programmes supporting IDPs and veterans.

Mathematical formalisation of the conceptual model. To provide a rigorous quantitative basis for the conceptual model, the following notation is introduced:

where E – integrated enterprise efficiency

E_f – financial efficiency

E_s – social efficiency

E_e – environmental efficiency

S – synergistic premium

I – innovation investment (M.U.)

Ccsr – CSR programme expenditure (M.U.)

B – total budget (M.U.)

a, b, g – weighting coefficients of efficiency components

r_{ij} – synergy coefficient between channels i and j

Integrated efficiency function. Enterprise integrated efficiency is defined as a weighted sum of three components augmented by a synergistic premium:

$$E = \alpha \cdot E_f + \beta \cdot E_s + \gamma \cdot E_e + S, \quad (1)$$

subject to the normalisation constraint: $a + b + g = 1$, $a, b, g > 0$. As an illustrative example, applying the Analytic Hierarchy Process [17] with a priority on financial stabilisation under wartime conditions yields:

$$\alpha = 0.5; \beta = 0.3; \gamma = 0.2 \quad (2)$$

BSC decomposition. Following Kaplan and Norton (1992) [2], the financial component decomposes across four BSC perspectives:

$$E_f = w_1 \cdot K_f + w_2 \cdot K_c + w_3 \cdot K_p + w_4 \cdot K_l, w_1 + w_2 + w_3 + w_4 = 1 \quad (3)$$

where K_f, K_c, K_p, K_l – normalised indicators of the financial, customer, process, and learning perspectives.

Each indicator is normalised as $K_i = K_i(\text{actual}) / K_i(\text{benchmark})$.

Synergistic premium. The synergistic term S captures pairwise interactions between the four identified channels:

$$S = \sum_{i < j}^n r_{ij} \cdot \sqrt{E_i \cdot E_j}, r_{ij} \in [-1; 1]. \quad (4)$$

When all channel coefficients are positive, the whole exceeds the sum of parts property holds:

$$E > \alpha \cdot E_f + \beta \cdot E_s + \gamma \cdot E_e. \quad (5)$$

Innovation sub-function. The financial contribution of innovation activity is modelled by a Cobb-Douglas production function [18]:

$$E_f(I, L, K) = A \cdot I^\alpha \cdot L^{\beta_I} \cdot K^{\gamma_I}, \quad (6)$$

where A – total factor productivity coefficient;

$\alpha, \beta_I, \gamma_I$ – output elasticities with respect to innovation expenditure, labour, and capital.

The innovation expenditure elasticity e_I is a key calibration parameter. International empirical literature reports a wide range of estimates depending on sector, firm size, and institutional context; for transition and emerging economies the typical range spans from 0.1 to 0.8. B. Hall and J. Lerner (2010) [20] provide a comprehensive survey of R&D financing conditions that contextualises why this parameter is difficult to identify precisely. Empirical estimation of e_I on Ukrainian enterprise panel data remains a direction for further research.

Social capital index. Social efficiency E_s is measured through the Social Capital Index (SCI):

$$E_s = \text{SCI} = \frac{1}{m} \cdot \sum_{j=1}^m \delta_j \cdot P_j, \quad \sum_{j=1}^m \delta_j = 1. \quad (7)$$

where P_j – normalised value of the j -th social KPI (staff satisfaction, IDP/veteran employment share, training intensity, NPS, transparency level);

δ_j – weight of the j -th KPI.

The CSR multiplier model captures the indirect effect of social programmes on financial efficiency:

$$E_{\text{csr}} = E_f \cdot (1 + \mu \cdot E_s), \quad \mu \in (0; 1), \quad (8)$$

where μ – social impact multiplier: at $\mu = 0$ the model reduces to the traditional (no CSR) case.

Optimisation problem. The firm seeks the vector $(I^*, C_{\text{csr}}^*, E^*)$ that maximises equation (1) subject to:

$$I + C_{\text{csr}} + C_e \leq B \quad (9)$$

$$I \geq I_{\min}, C_{\text{csr}} \geq C_{\min} \quad (10)$$

$$E_f \geq E_{f0}, E_s \geq E_{s0} \quad (11)$$

The Kuhn-Tucker conditions [19] for the interior solution imply that in the optimum the marginal return of one additional monetary unit of innovation investment equals that of CSR investment, rigorously justifying simultaneous rather than sequential funding of both programmes:

$$\alpha \cdot \frac{\partial E_f}{\partial I} + \frac{\partial S}{\partial I} = \lambda_B + \mu_{Iv}, \quad (12)$$

$$\beta \cdot \frac{\partial \text{SCI}}{\partial C_{\text{csr}}} + \frac{\partial S}{\partial C_{\text{csr}}} = \lambda_B + \mu_{Cv}, \quad (13)$$

where λ_B – Lagrange multiplier of the budget constraint;

μ_{Iv}, μ_{Cv} – multipliers of the floor requirements.

Dynamic adjustment model. The convergence trajectory of E toward the target level E_{target} is governed by:

$$\frac{dE(t)}{dt} = f \cdot [E^*(I(t), C_{\text{csr}}(t)) - E(t)]. \quad (14)$$

The solution at constant I and C_{csr} :

$$E(t) = E^* - (E^* - E_0) \cdot e^{-f \cdot t}, \quad (15)$$

where f – adjustment speed parameter ($f > 0$);

E_0 – initial efficiency level;

E_{target} – equilibrium target efficiency level.

The adjustment speed parameter f governs the pace of convergence. For illustrative calibration purposes, $f \in [0.2; 0.6]$ per quarter implies that 50-90% of the equilibrium level is reached within 2-8 quarters. Empirical estimation of f requires time-series data on E and constitutes a direction for further research.

Synergetic Value Added criterion. To operationalise the adoption decision, the Synergetic Value Added (SVA) and Synergy Return Index (SRI) are defined:

$$SVA = E - (E_{f0} + E_{s0} + E_{e0}), \quad (16)$$

$$SRI = \frac{SVA}{(1 + C_{csr} + C_e)} \cdot 100\%, \quad (17)$$

where E_{f0} , E_{s0} , E_{e0} - baseline levels of efficiency components under the status-quo (no integration) strategy.

Decision rule: $SVA > 0$ means the integrative strategy is superior to the status-quo baseline. The SRI provides a normalised, comparable measure of synergistic returns across enterprises of different sizes and sectors, and can be computed from publicly available sustainability report data once SCI measurement is standardised.

The three-layer conceptual model, illustrated in Figure 1, integrates all components described above. The strategic layer corresponds to equations (1)-(3): an integrated business model grounded in CSV, aligning financial targets with UN Sustainable Development Goals and establishing KPIs that span both financial (EBITDA, ROI) and non-financial dimensions. The operational layer implements equations (6)-(8): innovation technologies (digitalisation, automation, R&D partnerships), socially-oriented HR practices (veteran and IDP reintegration programmes, flexible working arrangements), environmental responsibility, and transparent GRI/ESRS reporting. The result layer is measured by E (1) and the SVA/SRI pair (16)-(17): labour productivity gains, competitive positioning, reputational capital, and sustainable regional development. The synergistic premium S (4) guarantees fulfilment of inequality (5), consistent with the double dividend principle of van Marrewijk [16].

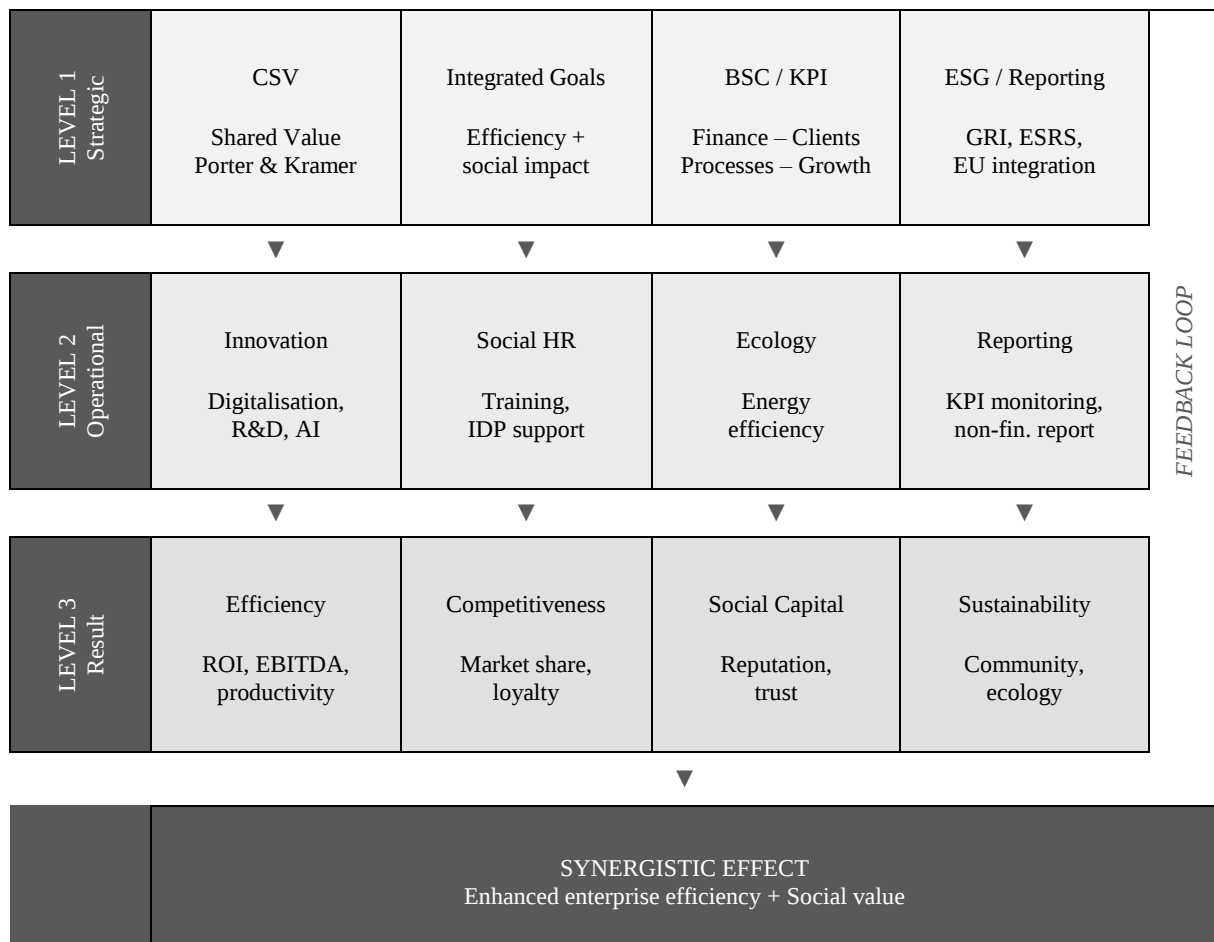


Figure 1. Three-layer conceptual model of integration of innovative and socially-oriented business solutions

Source: authors' own elaboration

The three-layer conceptual model presented in Figure 1 is structured as a cascading system in which strategic intent translates into operational actions and ultimately generates measurable results, with a feedback loop ensuring continuous adjustment.

Level 1 – Strategic constitutes the foundation of the model and comprises four interrelated strategic pillars. The Creating Shared Value (CSV) concept, following Porter and Kramer, reframes social and environmental challenges as sources of market opportunity rather than cost obligations. The pillar of Integrated Goals aligns financial efficiency targets with broader social impact objectives, ensuring that the two are pursued simultaneously rather than traded off against each other. The BSC/KPI pillar operationalises this alignment through a balanced measurement system spanning financial performance, client relations, internal processes, and organisational growth. Finally, the ESG/Reporting pillar anchors the strategy in accountability frameworks - GRI, ESRS, and EU integration requirements – that make commitments verifiable to external stakeholders.

Level 2 – Operational translates strategic intent into concrete management actions across four domains. Innovation encompasses digitalisation, R&D investment, and the application of artificial intelligence to enhance operational performance. Social HR covers workforce development programmes, including training initiatives and support for internally displaced persons, addressing both productivity and social cohesion objectives. Ecology focuses on energy efficiency measures that simultaneously reduce operating costs and environmental impact. Reporting closes the operational loop through KPI monitoring and the preparation of non-financial reports, providing the data infrastructure necessary for evidence-based management decisions.

Level 3 – Result captures the outcomes generated by the operational layer across four dimensions. Efficiency is measured through conventional financial indicators such as ROI, EBITDA, and labour productivity. Competitiveness reflects the enterprise's improved market position, expressed in market share growth and customer loyalty. Social Capital accumulates through enhanced organisational reputation and deepened stakeholder trust – assets that are difficult to build quickly but provide durable competitive protection. Sustainability encompasses the enterprise's contribution to community welfare and environmental stewardship, linking firm-level performance to broader societal outcomes.

The bottom of the model identifies the Synergistic Effect as the overarching outcome: enhanced enterprise efficiency combined with social value creation. This synergy arises precisely because the four pillars of each level reinforce one another rather than operating in isolation – digitalisation enables personalised social programmes, ESG compliance drives technological upgrading, and reputational capital attracts the talent that makes innovation possible. The feedback loop depicted on the right-hand side of the figure captures the dynamic nature of this system: results from Level 3 feed back into the strategic priorities of Level 1, enabling the enterprise to recalibrate its weighting of efficiency components and synergy coefficients as the external environment evolves.

Table 2 provides a comparative assessment of the traditional and integrative strategies across key performance parameters.

Table 2. Comparative characteristics of enterprise management strategies

Parameter	Traditional strategy	Integrative strategy (Innovation + CSR)
Planning horizon	Short-term (1-2 yrs)	Long-term (3-7 yrs), aligned with EU approximation and post-war reconstruction cycles
Objective function	Maximise financial profit	Maximise integrated efficiency across financial, social, and ecological dimensions simultaneously
Key KPIs	Profit, return on equity	Balanced set: financial returns, customer loyalty, process efficiency, staff development, social impact, and carbon footprint
Human capital	Cost minimisation	Treated as a strategic asset: investment in training, veteran and IDP reintegration, flexible arrangements to attract talent under labour scarcity
Innovation	Reactive (market-driven)	Proactive and systematic: R&D partnerships, open innovation, technology scouting guided by both market signals and social needs
Social programmes	Declarative (PR function)	Embedded in the business model as a source of competitive advantage and market access, not a PR add-on
Synergy assessment	Not provided	Quantified through the Synergetic Value Added (SVA) criterion: positive SVA confirms that integration outperforms independent operation of each component
Reputation impact	Neutral / unpredictable	Deliberately built through transparent ESG reporting (GRI/ESRS), CSR communication, and measurable stakeholder engagement

Source: elaborated by the author based on [2, 7, 10]

The practical feasibility of the proposed integrative model is corroborated by the experience of leading Ukrainian enterprises that have pursued simultaneous innovation and CSR strategies over an extended period. Kernel, one of Ukraine's largest agri-food exporters, combines large-scale investment in precision agriculture technologies and logistics digitalisation with annual sustainability reporting under GRI standards, covering scope 1-3 greenhouse gas emissions, water consumption, and supplier social audits. MHP, a vertically integrated poultry producer, maintains an active R&D programme focused on feed efficiency and biogas generation from agricultural waste, while simultaneously reporting under SASB standards and operating social infrastructure programmes in rural communities where it is the primary employer. DTEK, Ukraine's largest private energy company, has committed to a coal-phase-out roadmap aligned with the European Green Deal, channelling the associated capital

expenditure into renewable energy capacity – a transition that is simultaneously an ESG compliance measure, a long-term efficiency investment, and a strategic positioning for post-war European market access.

The common thread across these cases is that innovation investment and CSR commitments are not managed as competing budget lines but as mutually reinforcing programmes: ESG reporting disciplines create the measurement infrastructure that improves operational decision-making, while reputational capital built through social programmes facilitates talent attraction and retention in a severely constrained labour market. This pattern is qualitatively consistent with the $SVA > 0$ condition derived in the model – that is, the integrated strategy generates efficiency outcomes that exceed what the financial, social, and environmental components would produce if managed independently. However, these cases provide illustrative support rather than quantitative validation. Rigorous estimation of the Synergy Return Index for each company – drawing on the financial and non-financial data already disclosed in their public sustainability reports – constitutes a concrete and tractable direction for further empirical research.

Conclusions and prospects for further research

The research conducted allows the following conclusions to be drawn:

1. Enterprise efficiency today means more than financial results, it also encompasses social, innovation, and ecological dimensions. Established frameworks such as the Balanced Scorecard, the Creating Shared Value concept, and the Corporate Social Responsibility pyramid all point to the same conclusion: social and environmental performance does not limit financial efficiency but contributes to it. The paper brings this insight together in a three-layer model where the balance between efficiency components is treated as a management choice, not a fixed formula. In the context of wartime Ukraine, this means prioritising financial stabilisation while maintaining social and environmental commitments as long-term strategic assets rather than secondary concerns.

2. Ukrainian business data support the practical relevance of the proposed framework. The number of innovation-active enterprises nearly doubled between 2021 and 2024, despite armed conflict, destruction of energy infrastructure, and severe labour shortages. This suggests that Ukrainian companies have a strong capacity to adapt under pressure, choosing structural transformation over incremental adjustment when circumstances demand it. At the same time, the evidence points to a key constraint: innovation investment in Ukraine is held back not by a lack of will but by limited access to capital and institutional support, a finding that carries direct implications for reconstruction policy.

3. The central theoretical contribution of the paper is a formal demonstration that innovation and corporate social responsibility, when pursued together, produce greater efficiency gains than either approach generates on its own. This additional gain, the synergistic premium, is not a metaphor but a mathematically grounded property of the integrated model. Four mechanisms that produce this synergy are identified: social innovations that open new markets; reputational capital that helps attract and retain talent; environmental, social and governance standards that push companies toward better technologies; and digitalisation that makes socially oriented programmes more effective and scalable. The practical implication is clear: when resources are limited, investing in both innovation and corporate social responsibility simultaneously delivers better results than pursuing them one at a time.

4. The paper introduces the Synergetic Value Added criterion, a straightforward indicator that helps managers decide whether an integrated innovation and social responsibility strategy is worth adopting for their specific organisation. The decision rule is simple: if the integrated approach produces higher efficiency than the sum of its parts, the strategy is worth pursuing. A companion indicator, the Synergy Return Index, adjusts this result for the size of programme investment, making it possible to compare results across companies and sectors. Both indicators can be calculated from sustainability reports that companies already publish under widely used international standards, which means they are immediately usable by managers, investors, regulators, and consultants without access to internal data.

5. The dynamic part of the model addresses a question that strategy frameworks rarely tackle directly: how long does it take for an integrated strategy to show results, and how should management explain the transition period to stakeholders? The model shows that progress is not linear, early investments in innovation and social responsibility infrastructure take time to interact and compound, but once they do, returns accelerate. This has important consequences for how companies are evaluated: organisations in the early stages of integration will look less productive than their potential if judged solely by short-term financial indicators. The model therefore offers a sound basis for designing multi-year performance agreements that reflect the actual dynamics of strategic change.

Directions for further research include: empirical testing of the model's parameters using company-level data and robust statistical methods that account for reverse causality; development of measurement approaches for the Social Capital Index tailored to specific sectors such as logistics, agri-food, energy, and information technology; construction of a Synergy Return Index database drawing on publicly available sustainability reports of Ukrainian companies; and analysis of how policy instruments, including tax incentives, grant co-financing, and regulatory sandboxes, influence the size of synergistic returns in the specific context of Ukraine's post-war reconstruction and pathway toward European Union membership.

The study was conducted within the framework of the research project: "Management of integrated high-tech industries for the production of innovative products for the defence capability and sustainable development of Ukraine" (0125U001609).

Abstract

Introduction. Ukrainian enterprises face challenges without historical precedent: full-scale armed conflict since February 2022, systematic destruction of energy infrastructure, acute labour shortages, and the binding requirements of European Union integration. Kyivstar Business research shows that only 18% of companies increased profit in 2025, while 37% recorded a decline. Conventional managerial responses prove insufficient; a transformation of the business model is required – one capable of generating economic results and social benefit simultaneously, a property referred to as the double dividend. The Creating Shared Value concept and innovation management theory offer a foundation for overcoming the opposition between efficiency and social responsibility.

Purpose. The article develops a mathematically grounded three-layer conceptual model integrating innovative and socially-oriented business solutions, examines innovation activity dynamics among Ukrainian enterprises, and substantiates implementation recommendations. The objectives are: to systematise theoretical approaches to enterprise efficiency; to formalise synergy mechanisms; to construct an integrated efficiency function; and to derive an operational criterion for strategy adoption.

Methods. The research draws on systemic-structural analysis, comparative and statistical methods, and mathematical modelling encompassing production functions, differential equations and nonlinear programming, with the Analytic Hierarchy Process applied for weight estimation. Data come from the State Statistics Service of Ukraine, the Global Innovation Index for 2021-2024, the Ministry of Economy of Ukraine, Corporate Social Responsibility Ukraine, and Kyivstar Business research.

Results. The paper proposes an integrated three-layer model in which the joint optimisation of innovation and corporate social responsibility drives enterprise efficiency. Four synergy channels are identified: social innovations that open market opportunities; reputational capital that eases constraints in talent acquisition; environmental, social and governance standards that stimulate technological investment; and digitalisation that reinforces operational and social improvements. A formal apparatus is introduced – an integrated efficiency function with a synergistic premium, a Social Capital Index, and a Synergetic Value Added criterion – translating the double dividend into a measurable management tool. The model reflects the context of wartime Ukraine and is designed for post-war application.

Conclusion. Enterprise efficiency today encompasses financial, social and ecological dimensions as an inseparable whole. Integrating innovation with corporate social responsibility generates returns that neither component produces independently, validating the double dividend principle. The proposed apparatus provides a scalable, verifiable instrument for strategies aligned with European Union standards and Ukraine post-war recovery requirements.

«Автор цієї статті Єрмак С.О. є членом редакційної колегії журналу. Рукопис розглядався із дотриманням вимог зовнішнього подвійного сліпого рецензування. Рішення щодо рукопису ухвалено головним редактором без участі автора.»

References:

1. Kyivstar Business. (2025). What was 2025 like for Ukrainian business: Research results. <https://hub.kyivstar.ua/articles/yakim-buv-2025-rik-dlya-ukrayinskogo-biznesu>
2. Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. *Harvard Business Review*, 70(1), 71-79. <https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2>
3. Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. Harper & Row.
4. Drucker, P. F. (1985). *Innovation and entrepreneurship: Practice and principles*. Harper & Row.
5. Christensen, C. M. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*. Harvard Business School Press.
6. Carroll, A. B. (2015). Corporate social responsibility: The centerpiece of competing and complementary frameworks. *Organizational Dynamics*, 44(2), 87-96. <https://doi.org/10.1016/j.orgdyn.2015.02.002>
7. Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, 89(1-2), 62-77.
8. Orlova, N., Vynnyk, T., & Pobihun, S. (2023). Innovative business development strategies in crisis conditions. *Ekonomika ta suspilstvo*, 56. <https://doi.org/10.32782/2524-0072/2023-56-75>
9. Dykha, M. V., & Dykha, V. V. (2023). Analysis of Ukraine's positions in the Global Innovation Index ranking. *Kyivskyi ekonomichnyi naukovi zhurnal*, 2, 5-14.
10. Lifintsev, D. S. (2013). Corporate social responsibility as a component of organizational culture]. *Efektivna ekonomika*, 11. <http://www.economy.nayka.com.ua/?op=1&z=2505>
11. Ministry of Economy of Ukraine. (2023). Information materials on innovation activity. <https://me.gov.ua>

12. National Institute for Strategic Studies. (2025). Innovation activity of industrial enterprises. <https://niss.gov.ua>
13. CSR Ukraine. (2021). How to become a socially responsible business. <https://csr-ukraine.org>
14. OBOZ.UA Projects. (2024). 2024 results: Achievements and innovations of leading Ukrainian companies. <https://projects.obozrevatel.com>
15. van Marrewijk, M. (2003). Concepts and definitions of CSR and corporate sustainability: Between agency and communion. *Journal of Business Ethics*, 44(2), 95-105. <https://doi.org/10.1023/A:1023331212247>
16. Saaty, T. L. (1980). *The analytic hierarchy process: Planning, priority setting, resource allocation*. McGraw-Hill.
17. Cobb, C. W., & Douglas, P. H. (1928). A theory of production. *American Economic Review*, 18(1, Suppl.), 139-165.
18. Kuhn, H. W., & Tucker, A. W. (1951). Nonlinear programming. In J. Neyman (Ed.), *Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability* (pp. 481-492). University of California Press. <https://doi.org/10.1525/9780520411586-036>
19. Hall, B. H., & Lerner, J. (2010). The financing of R&D and innovation. In B. H. Hall & N. Rosenberg (Eds.), *Handbook of the Economics of Innovation* (Vol. 1, pp. 609-639). Elsevier. [https://doi.org/10.1016/S0169-7218\(10\)01014-2](https://doi.org/10.1016/S0169-7218(10)01014-2)
20. Kernel Holding S.A. (2024). Annual report and accounts for the year ended 30 June 2024. https://www.kernel.ua/wp-content/uploads/2024/10/FY2024_Kernel_Annual_Report_.pdf
21. MHP SE. (2024). Integrated annual report and accounts 2023. <https://mhp.com.ua/en/annual-reports>
22. DTEK Group. (2024). Sustainability. <https://dtek.com/en/sustainability/>
23. Filippova, S. V., & Yermak, S. O. (2019). Formation of a model of inclusive economic development. *Efektivna ekonomika*, 10. <https://doi.org/10.32702/2307-2105-2019.10.19>
24. Frolova, L. V., & Yermak, S. O. (2021). Development of corporate social responsibility among business structures of Ukraine. *Efektivna ekonomika*, 4. <https://doi.org/10.32702/2307-2105-2021.4.13>

Посилання на статтю:

Yermak S.O. *Integration of Innovative and Socially-Oriented Business Solutions to Enhance Enterprise Performance* / S.O. Yermak, D.O. Dochev // *Економічний журнал Одеського політехнічного університету*. – 2026. – № 2 (36). – С. 41-50. – Режим доступу: <https://ejop.economics.net.ua/ejopu/2026/No2/41.pdf>. <https://doi.org/10.15276/EJ.02.2026.5>. <https://zenodo.org/records/21250445>.

Reference a Journal Article:

Yermak S.O. *Integration of Innovative and Socially-Oriented Business Solutions to Enhance Enterprise Performance* / S.O. Yermak, D.O. Dochev // *Economic journal Odessa polytechnic university*. – 2026. – № 2 (36). – P. 41-50. – Retrieved from: <https://ejop.economics.net.ua/ejopu/2026/No2/41.pdf>. <https://doi.org/10.15276/EJ.02.2026.5>. <https://zenodo.org/records/21250445>.



This is an open access journal and all published articles are licensed under the terms of the Creative Commons Attribution License (CC BY 4.0)