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A CONCEPTUAL MULTILEVEL TRANSMISSION FRAMEWORK LINKING ENTERPRISE MANAGEMENT TO ECONOMIC EFFICIENCY AND MACROECONOMIC STABILITY

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Abstract. *This study develops a multilevel management-driven conceptual framework explaining the hierarchical transmission of enterprise-level managerial capabilities into economic efficiency and macroeconomic stability. The research aims to systematize contemporary management approaches influencing firm performance and to substantiate a cumulative transmission model linking managerial systems, firm-level outcomes, sectoral dynamics, and macroeconomic indicators. The paper integrates strategic management, performance measurement systems, digital transformation, human capital development, and operational optimization into a coherent analytical architecture. A hierarchical cumulative transmission model is proposed, conceptualizing four interconnected levels: 1) managerial capabilities at the enterprise level; 2) measurable firm-level economic outcomes, including productivity and capital efficiency; 3) sectoral aggregation effects; and 4) macroeconomic stability reflected in GDP growth, wage dynamics, and employment structures. The model emphasizes cumulative, lagged, conditional, and institutionally moderated effects, highlighting the non-linear nature of efficiency propagation across economic levels. Contextual analysis of official statistical data for Azerbaijan (2020–2025) indicates that wage growth, sectoral modernization, and productivity improvements can be interpreted as aggregated outcomes of enterprise-level managerial modernization and digital transformation. The findings confirm that sustainable macroeconomic stability depends not only on capital accumulation but also on the quality of strategic alignment, performance measurement, digital integration, and human capital management within firms. The proposed framework contributes to management and economic theory by formalizing the micro–macro linkage and offers practical implications for enterprises and policymakers aiming to strengthen long-term economic resilience and competitiveness.*

Key words: *multilevel management framework; managerial capabilities; economic efficiency; digital transformation; labor productivity; macroeconomic stability; performance measurement systems; sectoral aggregation.*

Introduction. In recent years, improving the efficiency of economic activity has become one of the central priorities for business entities in Azerbaijan. The COVID-19 pandemic and subsequent global economic disturbances led to a 4.3 % contraction of GDP in 2020, intensifying pressures on enterprises to reconsider resource allocation, cost structures, and managerial priorities. The economy resumed growth

in 2021 and 2022, expanding by 5.62 % and 4.71 %, respectively. However, growth slowed to 1.12 % in 2023, increased to 4.1 % in 2024, and declined again to 1.4 % in 2025. These fluctuations reflect not only external shocks and energy market volatility, but also structural adjustments and heterogeneous firm-level responses within the national economy.

Such macroeconomic instability highlights a fundamental analytical challenge. Aggregate indicators such as GDP growth, wage dynamics, and employment stability represent cumulative outcomes that emerge from the performance of enterprises. At the same time, enterprise performance is largely shaped by managerial systems, strategic alignment mechanisms, performance measurement architectures, and adaptive organizational capabilities. Despite this interdependence, economic efficiency and macroeconomic stability are frequently examined as analytically distinct domains.

Existing research extensively investigates firm-level efficiency, performance measurement systems, and digital transformation effects [1; 2]. Parallel streams of literature focus on macroeconomic volatility and growth dynamics, emphasizing the effects of business cycles, external shocks, and structural change on aggregate output and employment [3; 4]. While these research directions provide important insights into microeconomic performance and macroeconomic variability, they rarely establish an explicit analytical linkage between managerial capabilities at the enterprise level and macroeconomic stability at the national level.

In volatile economic environments characterized by uncertainty, technological transformation, and structural adjustments, efficiency can no longer be interpreted solely through static financial indicators. Instead, it should be understood within a broader management architecture incorporating strategic alignment, performance measurement systems, digital transformation, human capital development, and operational optimization [5; 6]. These elements shape firm-level productivity and competitiveness and may, through sectoral aggregation mechanisms, contribute to macroeconomic dynamics.

Against this background, the study develops a management-driven multilevel conceptual framework grounded in the logic of hierarchical economic aggregation. Economic efficiency is conceptualized as a cumulative and institutionally conditioned process in which enterprise-level managerial capabilities generate firm-level outcomes that, through sectoral aggregation, shape macroeconomic performance and stability.

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Using official statistical indicators for 2020–2025 as contextual illustration, the article structures established management approaches into a coherent transmission architecture linking micro-, meso-, and macro-level dynamics. By positioning managerial capabilities as the core transmission variable across analytical levels, the study provides a theoretically integrated explanation of how economic efficiency propagates within the economic system.

Analysis of recent researches and publications. The academic literature on economic efficiency, managerial capabilities, and macroeconomic outcomes has expanded considerably in recent years, yet it remains fragmented with respect to integrating firm-level managerial practices with macroeconomic stability. Historically, research on organizational effectiveness has emphasized microeconomic processes, such as the development of dynamic capabilities and strategic management systems within firms. The seminal work on dynamic capabilities established the foundation for understanding how firms adapt and reconfigure internal resources to maintain competitive advantage under conditions of uncertainty [7]. Subsequent systematic reviews have reaffirmed the centrality of dynamic capabilities to firm performance, particularly in turbulent environments [8], illustrating that managerial adaptability is crucial for operational resilience and competitive positioning.

Parallel strands of research have focused on digital capabilities and transformation, emphasizing their role as drivers of efficiency through process optimization, improved decision making, and integration of advanced technologies across organizational functions [9]. These studies collectively highlight that digital competencies are closely tied to internal performance metrics – including productivity, cost control, and innovation outputs – and are increasingly becoming core elements of modern enterprise strategy.

At the same time, strategic management frameworks, such as the Balanced Scorecard, have gained prominence as tools that connect high-level organizational objectives with measurable outcomes across financial and non-financial domains. Proponents argue that such systems enable firms to translate mission and strategy into performance indicators that guide decision making and monitor progress [10]. Balanced Scorecard research demonstrates its utility in enhancing internal alignment and managerial accountability, although evidence suggests

that its application and outcomes can vary significantly across contexts [11].

Despite these rich strands of literature, the direct analytical linkage between firm level managerial practices and macroeconomic indicators remains underdeveloped. Most studies examine managerial systems and digital transformation in isolation within single firms or industries, without extending their findings to aggregated economic outcomes such as GDP growth, employment stability, or national productivity. Reviews of the literature confirm that while digital and strategic capabilities can be quantified at the firm level, there is limited empirical evidence connecting these competencies to sectoral dynamics or macroeconomic stability, indicating a persistent gap in multilevel integration of analysis [12].

Research in the context of national economies further highlights this gap. For instance, literature emanating from Azerbaijan focuses on enterprise performance measurement and managerial practices but tends to be descriptive and sector-specific rather than theoretically unified [13]. Studies examining Azerbaijani firms or sectors describe challenges and opportunities in labor productivity, innovation policy, and human capital development, but do not systematically link these processes to broader economic trends. As a result, although these studies provide valuable insights into localized practices and firm outcomes, they do not establish a comprehensive conceptual model that explains how such practices might cumulatively influence macroeconomic stability or growth trajectories.

Moreover, broader reviews of capability accumulation in economic models suggest theoretical mechanisms by which micro level competencies may aggregate to influence growth, yet these frameworks are seldom operationalized for managerial variables. For example, analyses of capability accumulation within macroeconomic modeling illustrate how productivity and institutional quality affect growth outcomes, but managerial practices per se are treated indirectly or as part of broader institutional factors [12]. Consequently, the literature lacks a multilevel analytical framework that traces the hierarchical transmission of managerial capabilities from the enterprise level through sectoral aggregation to national economic performance.

Beyond firm-level perspectives, an important stream of research explicitly addresses the micro–macro linkage by examining how

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managerial practices, productivity differentials, and resource allocation mechanisms scale up to influence aggregate economic performance. A foundational contribution is the empirical work demonstrating that variations in management quality systematically explain cross-firm productivity differences [14]. This line of inquiry reframed management practices not merely as organizational attributes but as measurable drivers of efficiency with macroeconomic implications. Subsequent studies advanced this argument by conceptualizing management as a form of technology capable of shaping national productivity trajectories [15]. These findings suggest that heterogeneity in managerial capabilities contributes to total factor productivity (TFP) dispersion, thereby affecting aggregate output.

Complementary research within productivity economics emphasizes the aggregation problem, showing that macroeconomic efficiency is strongly influenced by firm dynamics and resource reallocation processes. Studies on productivity dispersion indicate that aggregate productivity growth depends not only on within-firm improvements but also on between-firm reallocation effects [16]. Cross-country analyses further confirm that differences in allocative efficiency and market selection mechanisms explain substantial variations in national productivity levels [17]. From this perspective, micro-level inefficiencies, including those rooted in managerial quality, propagate through structural channels such as market competition, innovation diffusion, and factor mobility.

Despite recognizing the macroeconomic relevance of firm heterogeneity, these models typically treat managerial practices indirectly, embedding them within broader constructs such as productivity, organizational capital, or institutional quality. Reviews of productivity research underscore that while management quality correlates with firm performance and TFP, the causal transmission mechanisms linking managerial systems to macroeconomic stability remain only partially specified [18]. Consequently, although existing studies acknowledge that micro-level capabilities aggregate into macroeconomic outcomes, the literature still lacks an integrated multilevel framework that explicitly models managerial practices as distinct analytical variables bridging firm efficiency and macroeconomic performance. This unresolved theoretical gap justifies the development of models capable of capturing the

hierarchical transmission of managerial capabilities across micro, meso, and macro levels of economic analysis.

Unresolved aspects of the general problem. Existing research provides substantial evidence that dynamic capabilities, digital transformation, performance measurement systems, and strategic management practices are positively associated with firm-level productivity, competitiveness, and financial performance. However, these streams of literature remain conceptually fragmented and predominantly confined to the microeconomic level. A coherent analytical framework explaining how enterprise-level managerial systems cumulatively transmit their effects through sectoral structures to influence macroeconomic efficiency and stability is still insufficiently developed.

This limitation is particularly visible in studies devoted to transitional economies, including Azerbaijan, where empirical research often focuses on isolated managerial instruments without establishing measurable linkages to aggregated macroeconomic indicators (GDP growth, productivity dynamics, investment activity, and structural transformation). Consequently, the systemic and hierarchical nature of management-driven economic development remains underexplored.

Addressing this gap requires theoretical integration and the construction of a multilevel transmission model capable of conceptually and analytically connecting managerial capabilities, firm-level outcomes, sectoral performance, and macroeconomic stability indicators.

The formulation of the objectives of the article. The objective of this article is to develop a multilevel management-driven conceptual framework explaining the hierarchical transmission of enterprise-level managerial capabilities into economic efficiency and macroeconomic stability. The study aims to systematize contemporary management approaches influencing enterprise efficiency and to substantiate a hierarchical cumulative transmission model linking managerial systems, firm-level performance outcomes, sectoral dynamics, and macroeconomic indicators.

The article further seeks to describe the dynamics of key macroeconomic indicators of Azerbaijan for the period 2020–2025 and to contextually interpret these dynamics through the lens of managerial modernization, digital transformation, performance measurement systems, and human capital development.

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Statement of the main material of the research. Within the proposed multilevel management-driven framework, economic efficiency is interpreted not as a static financial outcome but as a systemic performance characteristic emerging from the interaction of managerial capabilities, resource allocation mechanisms, organizational structures, and productivity dynamics. In analytical terms, efficiency has traditionally been defined as the ratio between economic outputs and inputs. However, in contemporary economic environments characterized by volatility, technological transformation, and structural shifts, efficiency increasingly reflects adaptive capacity, structural flexibility, and innovation-driven value creation rather than purely cost-based optimization.

At the enterprise level, efficiency manifests through multidimensional performance structures incorporating cost optimization, capital utilization, operational flexibility, and human capital productivity. Financial indicators such as EBITDA, ROCE, ROE, and ROA remain essential diagnostic instruments, as they capture profitability, capital efficiency, and return generation mechanisms. EBITDA reflects operating performance independent of depreciation structures; ROCE measures the effectiveness of employed capital; ROE evaluates returns generated for equity holders [13].

Yet, within a multilevel perspective, these indicators perform not only a diagnostic function but also serve as microeconomic transmission nodes: improvements in capital efficiency, profitability, and operational returns accumulate across firms and translate into sectoral productivity growth, investment expansion, and structural transformation.

From a multilevel analytical standpoint, labor productivity occupies a central position, as it links managerial decisions with measurable economic outcomes. Defined as value added per employee, labor productivity represents a key transmission variable connecting enterprise-level capabilities with sectoral and macroeconomic performance. Empirical research demonstrates that productivity growth is shaped by technological modernization, cost management practices, organizational optimization, and digital transformation processes. In Azerbaijan, labor productivity is considered a fundamental driver of economic development and competitiveness, particularly under conditions of structural economic adjustment [19].

Digitalization, automation, and data-driven decision systems further enhance productivity by reducing transaction costs, improving

coordination efficiency, and strengthening managerial responsiveness. Consequently, macroeconomic indicators such as wage dynamics, employment structures, and output growth may be interpreted within a systemic framework as aggregated reflections of firm-level efficiency processes [20].

In this context, the dynamics of average monthly nominal wages provide an informative, though indirect, proxy for analyzing efficiency-related structural changes in the economy. While wage growth may also be influenced by inflationary pressures and institutional factors, sustained real wage increases in the medium term typically correspond to productivity expansion, sectoral upgrading, and enhanced value creation capacity at the enterprise level.

The evolution of this indicator in Azerbaijan during 2020–2025 is presented in Table 1.

Table 1

Dynamics of the Average Monthly Nominal Wage (2020–2025)

Year	Average Monthly Nominal Wage (AZN)	Source
2020	707.3	According to preliminary data from the State Statistics Committee, in 2020 the average monthly nominal wage of salaried employees in the country increased by 11.4 % compared to the previous year and reached 707.3 AZN
2021	723.2	In January-September 2021, the average monthly nominal wage amounted to 723.2 AZN, increasing by 2.3 % compared to the same period of the previous year
2022	829.9	In January-November 2022, the average monthly nominal wage increased by 14.6 % compared to the previous year and reached 829.9 AZN
2023	923.1	In January-November 2023, the average monthly nominal wage increased by 11.2 % and amounted to 923.1 AZN
2024	993.0	In January-September 2024, the average monthly nominal wage increased by 8 % and amounted to 993 AZN
2025	1,089.0	In January-November 2025, the average monthly nominal wage increased by 9.3 % compared to 2024 and reached 1,089 AZN

Source: Compiled by the author based on [21]

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The data demonstrate a persistent upward trajectory of nominal wages throughout the observation period. Despite the macroeconomic disruptions and labor market instability associated with the COVID-19 pandemic in 2020, wage growth remained positive, indicating relative resilience of enterprise-level income generation and compensation systems under external shocks. Within the multilevel framework, this resilience may be interpreted as a reflection of adaptive managerial practices and sectoral adjustment mechanisms.

The comparatively moderate increase observed in 2021 corresponds to the post-pandemic recovery phase, during which economic activity gradually stabilized and firms adjusted operational and investment strategies. In contrast, 2022 and 2023 were characterized by accelerated wage growth, with double-digit expansion rates reflecting the combined influence of economic normalization, sectoral performance improvements, structural reallocation of resources, and revisions of compensation models in key industries.

The subsequent period (2024–2025) exhibits sustained yet more moderate growth, with rates fluctuating within the range of 8–9 percent. Such dynamics may indicate a transition from recovery-driven expansion to more balanced income formation processes. From a systemic perspective, wage growth during this stage can be associated with productivity improvements, sectoral upgrading, and inflationary pressures, although the relative contribution of each factor requires cautious interpretation.

Sectoral differentiation remains a notable characteristic of wage formation. In line with the structural profile of the Azerbaijani economy, the highest nominal wage levels were recorded in capital-intensive and high-value-added sectors, particularly mining, finance and insurance, and information and communication activities. These industries typically demonstrate higher capital intensity and productivity levels, which reinforces the structural linkage between sectoral efficiency, value creation capacity, and income differentiation.

Within the proposed multilevel transmission model, wage dynamics serve as an intermediate macroeconomic indicator reflecting the cumulative impact of enterprise-level efficiency processes. However, wages alone do not fully capture the overall trajectory of economic performance. To assess whether microeconomic efficiency gains translate into broader macroeconomic expansion, it is necessary to analyze aggregate output indicators.

Accordingly, the following section examines the dynamics of Azerbaijan's GDP growth over the period 2020–2025, as summarized in Table 2.

Table 2

Annual GDP Growth Rate of Azerbaijan (2020-2025)

Year	Annual GDP Growth Rate (%)	Source
2020	-4,30	In 2020, Azerbaijan's GDP decreased by 4.3 % compared to the previous year
2021	5,62	In 2021, the GDP growth rate was 5.62 %, indicating a recovery of 9.92 % compared to the previous year
2022	4,71	In 2022, economic growth declined to 4.71 %
2023	1,12	In 2023, the growth rate decreased sharply to 1.12 %
2024	4,10	According to the Trading Economics portal, Azerbaijan's economy grew by 4.1% in 2024
2025	1,40	According to the same source, the economic growth rate slowed to 1.4% in 2025.

Source: Compiled by the author based on [22] and [23]

Table 2 provides an overview of the annual GDP growth rates from 2020 to 2025, illustrating the fluctuations in economic performance during this period. The data reveal a sharp contraction in 2020 due to the pandemic, followed by a strong recovery in 2021. Subsequent years show a moderation of growth, with a notable slowdown in 2023 and 2025, reflecting both external economic pressures and sector-specific volatility, particularly in the energy industry. These trends highlight the uneven nature of economic recovery and underscore the need to consider sectoral and global influences when assessing overall economic efficiency.

Building on the analysis of GDP growth in Table 2, it is also essential to consider the structure of employment across economic sectors, as presented in Table 3.

Table 3 presents the distribution of employees by types of economic activity in 2025 and reflects the structural configuration of labor allocation within the national economy. The trade and repair of motor vehicles sector (18.6 %) and education (18.2 %) accounted for the largest shares of salaried employees, together comprising more than one-

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third of total employment. Industry (14.0 %) and construction (6.7 %) maintained substantial representation, confirming their continued significance for production capacity and infrastructure development. By contrast, agriculture, forestry and fishing (2.4 %) and financial and insurance activities (2.3 %) represented smaller employment shares, despite the latter being associated with comparatively high wage levels.

Table 3

Distribution of Employees by Types of Economic Activity in 2025

Type of Activity	Share in Total Number of Employees, %	Description
Trade and repair of motor vehicles	18.6	Employees working in retail and wholesale trade, as well as the sale and repair of motor vehicles.
Education	18.2	Teachers and administrative staff in public and private educational institutions.
Industry	14.0	Employees working in manufacturing and mining enterprises; the high-wage mining sector is included in this category.
Health and social services	8.5	Hospitals, clinics, and social service institutions.
Construction	6.7	Employees working in infrastructure projects and the production of construction materials.
Public administ-ration and defense	6.3	Civil servants and military personnel in public administration and defense institutions.
Transport and storage	4.5	Transportation, logistics services, and warehousing activities.
Professional, scientific, and technical activities	3.9	Engineering, design, research, and consulting services.
Agriculture, forestry, and fishing	2.4	Labor force mainly operating in the private sector.
Financial and insurance activities	2.3	Employees working in banks, insurance companies, and other financial institutions; a sector characterized by relatively high wages.
Other sectors	14.6	Culture, entertainment, services, information and communication, and other activities.

Source: Compiled by the author based on [24]

From the perspective of the proposed multilevel management-driven framework, the sectoral distribution of labor represents a structural transmission channel through which enterprise-level efficiency differentials are aggregated at the macroeconomic level. Employment concentration in trade and education indicates the labor-intensive nature of these activities, whereas sectors such as finance demonstrate higher value added per employee despite limited workforce size. Thus, the interaction between employment structure and sectoral productivity forms an important intermediate layer linking microeconomic management practices with national income dynamics.

When analyzed alongside the wage dynamics presented in Table 1, the employment composition provides additional explanatory context. As illustrated in Fig. 1, the average monthly nominal wage increased from 707.3 AZN in 2020 to 1,089 AZN in 2025, with accelerated growth observed in 2022–2023. Rather than interpreting this trajectory solely as a reflection of aggregate recovery, it may be understood as the cumulative outcome of differentiated sectoral productivity patterns, capital intensity, and managerial modernization processes across industries.

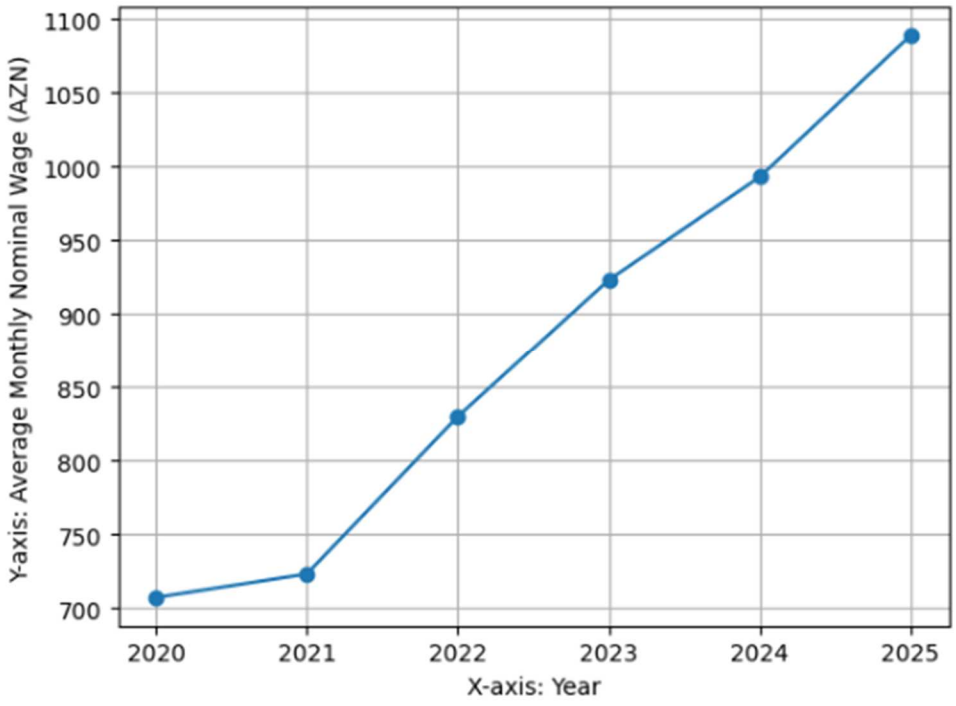

Fig. 1. **Dynamics of Average Monthly Nominal Wage in Azerbaijan**
Source: Compiled by the author based on research results

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Although the upward wage trend indicates macroeconomic stabilization following pandemic-related disruptions, wage indicators alone do not reveal the underlying sources of sustained efficiency growth. Within the multilevel framework, macroeconomic outcomes are ultimately shaped by firm-level managerial capabilities, strategic decision-making quality, and structural upgrading of business processes.

In this regard, digital transformation, innovation adoption, and human capital development function as key microeconomic drivers with macroeconomic implications. The diffusion of digital infrastructure, data analytics, and e-commerce technologies enhances operational coordination, reduces transaction costs, and increases responsiveness to market signals. The application of e-commerce and blockchain technologies contributes to cost optimization and competitive strengthening [20]. These tools not only improve enterprise-level efficiency but also cumulatively influence sectoral productivity and national competitiveness.

Sector-specific modernization further illustrates the transmission mechanism. In the construction industry, which plays a strategic role in infrastructure and capital formation, the application of innovative technologies and modernization of the material-technical base contributed to a 12.6 % increase in construction material production during 2021–2023. This expansion reflects improvements in resource utilization and managerial coordination, which support broader economic activity through multiplier effects.

Medium-sized enterprises also represent an important structural component of employment and value creation. Their development trajectory is influenced by access to finance, regulatory conditions, human capital availability, and innovation capacity. Within a systemic framework, improvements in managerial efficiency at the SME level contribute to employment stability, tax base expansion, and diversification of economic activity.

In contemporary economic environments, enterprises increasingly reallocate auxiliary functions to specialized external providers in order to concentrate resources on core strategic competencies. Outsourcing reduces operational costs, redistributes risks, and enables efficiency gains through specialization. Highly skilled services, including information technologies, research, and analytical activities, may also be

externalized provided that contractual governance mechanisms ensure transparency and the protection of commercial interests [25]. At the aggregate level, such specialization enhances sectoral productivity and strengthens competitive positioning.

Human resource management practices constitute another critical micro-level mechanism. Flexible labor standardization, performance evaluation systems, and continuous professional training contribute to productivity enhancement and cost optimization. Modern approaches emphasize decentralized and adaptive standard-setting, aligned with motivation and organizational control functions, thereby supporting efficiency growth [26].

The integration of strategic management with performance measurement systems represents a central coordinating mechanism within enterprises. Efficiency is no longer limited to profit maximization but encompasses multidimensional performance assessment combining financial and non-financial indicators. The alignment of mission, long-term objectives, and measurable performance indicators ensures systematic resource allocation and risk management. Approaches such as the Balanced Scorecard integrate financial, customer, internal process, and learning dimensions into a coherent analytical structure, facilitating strategic consistency. The implementation of Key Performance Indicators (KPIs) tailored to sectoral specifics enhances transparency and supports evidence-based decision-making.

From a multilevel perspective, the systematic integration of strategic management tools strengthens the consistency between enterprise-level objectives and macroeconomic development trajectories. Improvements in labor productivity, cost structures, innovation intensity, and capital efficiency accumulate across firms and sectors, thereby contributing to macroeconomic stability and sustainable growth. Properly established management systems at the enterprise level thus represent one of the foundational conditions for long-term economic sustainability [11].

The preceding analysis demonstrated that wage dynamics, employment structure, sectoral modernization, and digital transformation collectively reflect the aggregated outcomes of enterprise-level efficiency processes. However, to explain how managerial decisions are systematically translated into measurable performance results, it is

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necessary to formalize the internal coordination mechanism linking strategy, performance indicators, and efficiency outcomes.

Within the proposed multilevel management-driven framework, this coordination mechanism is operationalized through the integration of strategic management functions with multidimensional performance indicators. The structured relationship between these elements is summarized in Table 4.

Table 4

Model for Integrating Performance Indicators with Efficiency within Strategic Management

Dimension	Key Indicators (KPI)	Link with Management Function	Impact on Efficiency
Financial indicators	ROE, ROA, operating profit, cost level	Planning, control	Increases profitability of capital and assets, ensures cost optimization
Customer indicators	Customer satisfaction index, market share, sales growth	Marketing, strategic planning	Strengthens revenue stability and market position
Internal processes	Production cycle duration, cost per unit, productivity level	Organization, control	Improves efficiency of resource utilization
Innovation and development	Number of new products, level of digitalization, employee training hours	Motivation, strategic management	Ensures long-term competitiveness and sustainable growth
Human capital	Labor productivity, employee turnover, performance evaluation results	Motivation, standardization	Strengthens efficient use of human resources and organizational sustainability

Source: Compiled by the author based on [19]

Table 4 systematizes the interaction between strategic management functions and efficiency outcomes across multiple performance dimensions. The model demonstrates that efficiency cannot be reduced to financial results alone. While financial indicators (ROE, ROA, operating profit, cost level) measure the final economic outcome of managerial activity, they are shaped by a broader system of internal

processes, customer-oriented strategies, innovation dynamics, and human capital development.

Internal process indicators, including production cycle duration, cost per unit, and productivity level, directly influence the efficiency of resource utilization and the optimization of costs. Customer-oriented indicators, such as market share and sales growth, strengthen revenue stability and competitive positioning. Innovation and digitalization metrics ensure long-term adaptability and structural modernization, while human capital indicators, particularly labor productivity and performance evaluation results, constitute a fundamental driver of sustainable efficiency growth.

From a multilevel perspective, the integration of these dimensions performs a transmission function. Strategic planning, organization, motivation, and control align micro-level performance indicators with long-term enterprise objectives. When consistently implemented across firms and sectors, such alignment contributes to aggregate productivity growth, structural transformation, and macroeconomic stability.

Thus, Table 4 complements the empirical observations presented in Tables 1–3 by formalizing the internal managerial mechanisms through which enterprise-level efficiency is generated and subsequently aggregated at the sectoral and macroeconomic levels.

Building on the integrated model presented in Table 4, practical approaches such as digital transformation, innovation policy, development of medium-sized businesses, outsourcing, and labor standardization serve as mechanisms through which strategic management translates into measurable efficiency gains. Sector-specific examples, particularly from the construction industry and medium-sized enterprises, illustrate that effective management combined with innovation initiatives and, where appropriate, state support, plays a decisive role in shaping productivity, competitiveness, and sectoral development.

For Azerbaijani enterprises, the application of management strategies grounded in digital technologies and focused on human capital and innovation is a critical condition for sustaining economic growth. Analysis of official statistical indicators for 2020–2025, alongside contemporary scientific approaches, indicates that enterprise-level economic outcomes, reflected in wage dynamics, GDP trends, and

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sectoral employment distribution, directly correlate with the strategic and operational models implemented within firms. Specifically, initiatives such as digitalization of business processes, innovation-driven management, outsourcing of auxiliary functions, and flexible labor organization strengthen resource utilization efficiency and reinforce competitive advantage.

In contemporary economic environments, efficiency is no longer reducible to financial performance alone. It encompasses human capital development, organizational flexibility, and technological adaptation. Strategic planning, digital management tools, and structured labor organization together form the operational foundation that enables enterprises to generate sustained micro- and macro-level efficiency gains.

Based on the analysis, the following practical recommendations emerge:

1. Long-term strategic planning. Enterprises should implement scenario-based planning models to manage post-pandemic volatility and fluctuations in energy and input prices.

2. Digital technology integration. The deployment of big data analytics and automated decision-making systems optimizes processes, accelerates decision-making, and enhances data accuracy.

3. Human capital development. Continuous professional training and collaboration with universities and training centers strengthen workforce productivity and address skill shortages in medium-sized enterprises.

4. Innovation and creativity promotion. Pilot projects and sector-specific innovation policies, as seen in construction, diversify products and services and drive competitiveness.

5. Outsourcing strategy implementation. Delegating auxiliary functions to reliable external partners allows firms to focus on core activities while mitigating operational risks. Transparent contracts and risk management practices are essential.

6. State support and regulation. Expanding access to financial instruments, credit incentives, and tax benefits for medium-sized and innovation-driven enterprises stimulates efficiency growth and strengthens sectoral development.

Building on the analysis of strategic management practices, performance indicators, and practical mechanisms for enhancing efficiency (Tables 3 and 4), contemporary research increasingly emphasizes that organizational performance emerges not from isolated techniques, but from the integration of multiple conceptual approaches. Effective management requires the alignment of strategic objectives, operational execution, and performance measurement, complemented by digital integration, human capital development, and process optimization.

One well-established framework exemplifying this integration is the Balanced Scorecard (BSC), which enables organizations to balance financial and non-financial objectives across key perspectives, including financial results, customer outcomes, internal processes, and learning and innovation [27; 28]. Strategic management approaches highlight the importance of aligning firm strategy with operational execution. Tools such as the BSC translate mission and vision into measurable outcomes, facilitate continuous feedback loops, and enhance the organization's capacity to respond to competitive pressures and dynamic environments [11; 27].

Digital transformation plays a central role in shaping firm performance by integrating digital technologies into organizational processes and decision-making, which improves strategic responsiveness and operational flexibility. Empirical evidence indicates that digital transformation, particularly when complemented by robust organizational capital and governance, is positively associated with firm value and operational performance [29]. Key performance indicators (KPIs) are critical for linking digital initiatives to measurable outcomes such as productivity, cost efficiency, and innovation, although research in this area continues to evolve [6].

Human capital and innovation management further reinforce efficiency by enhancing adaptability, learning capability, and innovation potential. Investments in workforce skills, training programs, performance evaluations, and motivational systems are shown to improve organizationnal performance and support sustainable outcomes. Operational and organizational practices, including process standardization, Lean practices, and outsourcing, optimize workflows and resource allocation, contributing to quality improvements and cost reduction.

Table 5 presents a classification of conceptual approaches to management and enterprise efficiency, highlighting how complementary strategies interact to produce systemic performance outcomes.

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Table 5

Conceptual Approaches to Management and Enterprise Efficiency

Conceptual Approach	Core Idea/Essence	Typical Practices/Tools	Scientific Basis
Strategic Management Approach	Aligns long-term organizational goals with operational execution, ensuring resources and actions support strategic objectives	Strategic planning, mission/vision alignment, Balanced Scorecard	The Balanced Scorecard framework provides a structured method to translate strategy into measurable performance across multiple dimensions [30]
Digital and Innovation Approach	Leverages digital technologies and innovation to optimize processes, enhance decision making, and create new value	Big data analytics, decision support systems, digital platforms	Digital transformation is positively associated with firm performance when supported by organizational capital and robust governance [29]
Performance Measurement Approach	Uses structured performance metrics to monitor and guide organizational outcomes	KPI systems, integrated dashboards, periodically reviewed performance metrics	Systematic reviews of KPI use indicate that properly defined indicators are essential for evaluating digital transformation and performance [6]
Human Capital and Motivation Approach	Focuses on employee skills, motivation, and learning as drivers of productivity and innovation	Training programs, performance evaluations, motivation systems	HR and innovation systems contribute to improved organizational outcomes by strengthening capabilities and learning cycles [31]
Operational/ Organizational Efficiency Approach	Emphasizes process optimization and structural adjustments to reduce waste and improve quality	Standardized procedures, outsourcing, Lean practices	Operational disciplines improve efficiency through process improvement and resource optimization [32]

Source: Compiled by the author

The classification in Table 5 illustrates that enterprise efficiency is not the result of any single managerial tool, but emerges from the systemic interaction of complementary conceptual approaches. Each approach addresses a specific dimension of organizational performance while reinforcing others, forming a comprehensive framework for achieving sustained efficiency at both micro and macro levels.

Building on the conceptual classification presented in Table 5, the strategic management approach forms the structural foundation of the integrated system. By translating long-term objectives into measurable targets through instruments such as the Balanced Scorecard [27; 30], organizations ensure both vertical and horizontal alignment between corporate vision, tactical initiatives, and operational activities. Strategic coherence reduces fragmentation in decision-making and establishes a stable framework within which other efficiency-enhancing mechanisms can operate.

The performance measurement approach operationalizes strategy through quantifiable indicators. KPI systems and integrated dashboards allow continuous monitoring of progress toward strategic objectives and provide feedback mechanisms for corrective action [6]. In this sense, performance measurement acts as the connective layer between strategic intent and actual results, transforming abstract goals into measurable managerial outcomes.

The digital and innovation approach enhances both strategic execution and performance monitoring by embedding digital technologies into business processes. Empirical evidence suggests that digital transformation strengthens operational flexibility, improves information transparency, and increases overall firm value when supported by organizational capital and governance mechanisms [29]. Digital tools therefore amplify the effectiveness of strategic planning and KPI systems by improving data accuracy, analytical capability, and decision speed.

The human capital and motivation approach introduces the behavioral and capability dimension of efficiency. Investments in employee development, competence formation, and motivation systems expand the organization’s absorptive capacity and innovation potential. Without qualified and engaged personnel, neither digital technologies nor performance metrics can generate sustainable improvements. Thus, human capital acts as a multiplier of strategic and technological initiatives.

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Finally, the operational and organizational efficiency approach ensures that processes, structures, and workflows are optimized to minimize waste and enhance productivity. Lean practices, standardization, and structural rationalization translate strategic and digital initiatives into tangible cost reductions and quality improvements. Operational optimization therefore represents the materialization of strategic and performance-based intentions at the process level.

Taken together, these approaches form a multidimensional management architecture, as summarized in Table 5, in which:

- Strategy defines direction and priorities;
- Performance measurement ensures control and feedback;
- Digital transformation enhances analytical and operational capacity;
- Human capital enables adaptability and innovation;
- Operational optimization secures efficiency at the process level.

This integrated perspective implies that enterprise economic efficiency should be analyzed not merely through financial ratios, but through a holistic framework that captures strategic alignment, digital maturity, human capital development, and operational excellence simultaneously. Such an understanding provides the theoretical basis for developing a comprehensive evaluation model in the subsequent section of this study.

Macroeconomic indicators such as GDP growth, employment stability, and wage dynamics are aggregate outcomes formed through the interaction of thousands of economic agents. Therefore, explaining macroeconomic stability requires analytical linkage between micro-level managerial processes and national-level economic performance. To address this linkage, the present study develops a conceptual multilevel transmission model grounded in the logic of hierarchical economic aggregation.

Building on the integrated conceptual classification presented in Table 5, the multilevel structure of the proposed model translates enterprise-level managerial capabilities into measurable economic outcomes and, ultimately, macroeconomic stability. Economic efficiency does not arise spontaneously; rather, it emerges through a hierarchical transmission mechanism in which strategic, operational, digital, and human capital approaches are transformed into performance outcomes and aggregated across analytical levels.

The structure mirrors the architecture of the economy itself. Managerial practices are implemented at the enterprise (micro) level, their effects materialize in firm-level indicators, these outcomes accumulate within sectors (meso level), and only after aggregation do they influence macroeconomic dynamics. Thus, the model represents not an abstract construct but the actual propagation of managerial efficiency through the economic system.

Level I. Conceptual Management Approaches and Managerial Capabilities (Micro Level)

The first level operationalizes the five conceptual approaches identified in Table 5 as managerial capabilities embedded within the enterprise.

These include:

- Strategic alignment mechanisms (long-term planning, scenario modelling, Balanced Scorecard systems);
- Performance measurement systems (KPI frameworks and analytical dashboards);
- Digital and innovation practices (data-driven decision-making, process digitalization);
- Human capital development (training, motivation systems, competence upgrading);
- Operational and organizational optimization (process standardization, outsourcing, lean practices).

At this stage, managerial action does not directly affect macroeconomic indicators. Instead, it restructures the internal configuration of resources, enhances adaptive capacity, and increases organizational flexibility. Strategic coherence defines direction, performance metrics provide control, digital tools enhance responsiveness, human capital enables innovation, and operational optimization improves process efficiency.

In volatile environments, such as the Azerbaijani economy during 2020–2025, managerial adaptability becomes a decisive factor in enterprise sustainability. Thus, Level I represents the capability formation stage, where conceptual approaches are translated into organizational competencies.

Level II. Firm-Level Economic Outcomes

The second level captures the measurable consequences of managerial capabilities. Here, conceptual approaches are converted into quantifiable economic results.

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These outcomes include:

- Growth in labor productivity;
- Optimization of cost structures;
- Improved capital efficiency (ROE, ROA, ROCE);
- Increased innovation intensity;
- Enhanced operational resilience.

The transition from Level I to Level II constitutes the first transformation stage: managerial approaches generate performance effects. This transformation is cumulative and path-dependent rather than instantaneous. For example, digitalization enhances data quality and decision speed, which gradually improves productivity; strategic alignment reduces resource misallocation, increasing capital returns; human capital investments strengthen innovation capacity over time.

Thus, Level II represents the performance realization stage, where managerial capabilities materialize in firm-level economic indicators.

Level III. Sectoral Aggregation (Meso Level)

The third level reflects the principle of economic aggregation. When performance improvements occur across a critical mass of enterprises within a sector, individual productivity gains generate collective effects.

These include:

- Increased sectoral competitiveness;
- More stable employment structures;
- Sustainable wage growth;
- Diffusion of innovation and managerial practices.

Macroeconomic indicators are not influenced by isolated enterprises but by sector-wide dynamics. In Azerbaijan, sectors such as construction, trade, and industry illustrate how modernization of managerial systems contributes to output growth, labor redistribution, and technological upgrading.

The aggregation mechanism operates through competitive interaction, supply chain linkages, labor mobility, and technological spillovers. Accordingly, Level III represents the structural amplification stage, where firm-level efficiencies become sectoral performance trends.

Level IV. Macroeconomic Stability and Growth

The final level captures macroeconomic outcomes, including:

- GDP growth trajectories;
- Employment stability;

- Wage dynamics;
- Resilience to external shocks.

At this stage, macroeconomic performance reflects the cumulative effect of sectoral productivity shifts. Importantly, the transmission mechanism remains indirect. Conceptual management approaches do not alter macroeconomic indicators immediately. Instead, they initiate micro-level capability formation, which generates firm-level efficiency improvements, which in turn aggregate at the sectoral level and ultimately shape national economic dynamics.

In resource-dependent and externally exposed economies, this cumulative mechanism plays a stabilizing role. Diversified sectoral productivity growth reduces vulnerability to commodity price volatility and external shocks. Therefore, macroeconomic resilience can be interpreted as the systemic outcome of sustained managerial modernization at the micro level.

The transmission process is conditioned by institutional and structural variables, including:

- Regulatory quality and governance effectiveness;
- State support mechanisms;
- Digital infrastructure development;
- Global economic pressures;
- Energy market volatility.

These factors function as moderating variables that either strengthen or weaken the conversion of managerial capabilities into macroeconomic outcomes. For instance, strong institutional frameworks accelerate the diffusion of digital and strategic practices across firms, while infrastructure limitations may constrain their impact.

Consequently, the proposed model should be interpreted not as a linear deterministic chain but as a conditional hierarchical transmission system, in which conceptual management approaches initiate a multistage transformation process shaped by contextual moderators.

The integrated classification of conceptual management approaches presented above provides the theoretical foundation for extending the analysis beyond the firm level. While enterprise efficiency originates within the boundaries of individual organizations, its economic significance becomes fully observable only through aggregation across sectors and, ultimately, at the macroeconomic level.

To conceptualize this multistage transformation process, the study proposes a hierarchical cumulative transmission framework that links enterprise-level managerial capabilities with macroeconomic stability and growth. The logic of the model reflects the structural architecture of the economy itself: managerial practices operate at the micro level, generate measurable firm-level outcomes, accumulate within sectors, and, through aggregation mechanisms, influence national economic dynamics.

Unlike linear cause–effect representations, the proposed framework assumes cumulative progression, time lags, and feedback effects across levels. Managerial modernization does not instantaneously translate into macroeconomic growth; rather, it initiates a gradual transmission mechanism conditioned by institutional quality, regulatory frameworks, digital infrastructure, and global economic conditions.

The conceptual structure of this hierarchical transmission mechanism is illustrated in Fig. 2, which extends the analysis from enterprise efficiency (micro level) to sectoral aggregation (meso level) and finally to macroeconomic stability and growth.

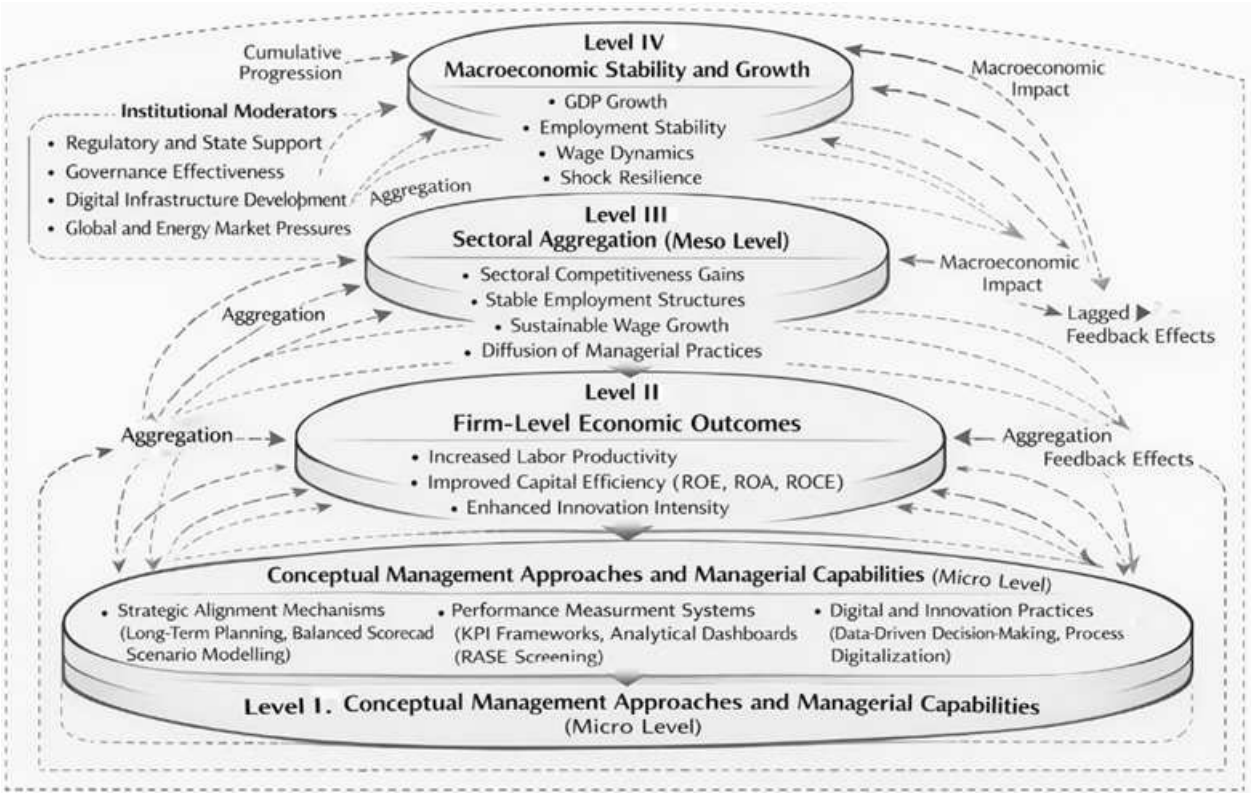

Fig. 2. **Hierarchical Cumulative Transmission Model: Linking Enterprise Dynamic Capabilities to Macroeconomic Stability**
Source: Developed by the author; visualization prepared using AI tools

Fig. 2 visualizes the hierarchical cumulative transmission model, providing a clear analytical representation of how enterprise-level managerial capabilities propagate through the economy to shape macroeconomic stability and growth. Each level of the model, from enterprise capabilities to sectoral aggregation and macroeconomic outcomes, illustrates cumulative, lagged, and conditionally moderated effects shaped by institutional quality, governance, and digital infrastructure.

The model explicitly incorporates contextual and institutional moderators, including regulatory quality, digital infrastructure, governance effectiveness, and global economic conditions, which influence the speed, magnitude, and sustainability of the transmission process. Time lags and feedback loops are also recognized, highlighting the nonlinear, cumulative, and path-dependent nature of the transformation from micro-level capabilities to macroeconomic outcomes. Importantly, feedback mechanisms allow macroeconomic and sectoral performance to influence enterprise-level strategic and operational decisions, reinforcing adaptive capacity and continuous improvement.

The hierarchical cumulative transmission model embodies four critical conceptual characteristics that deepen its explanatory power:

1. Cumulative – managerial capabilities at the enterprise level gradually accumulate, generating firm-level outcomes that, when aggregated across sectors, progressively shape macroeconomic indicators. Efficiency gains are therefore built over time, reflecting both the breadth and intensity of managerial modernization.

2. Lagged – the transformation from enterprise-level initiatives to macroeconomic outcomes occurs with temporal delays. Investments in human capital, digitalization, and process optimization may take months or years to materialize in measurable productivity gains, sectoral improvements, and broader economic stability.

3. Conditional – the effectiveness of managerial capabilities depends on internal and external conditions. Enterprise strategies, performance measurement systems, and operational improvements achieve optimal outcomes only when aligned with firm-specific resources, organizational culture, and strategic priorities.

4. Institutionally Moderated – institutional and structural factors, such as regulatory quality, governance effectiveness, digital infrastructure, and macroeconomic policy, function as moderators that either

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enhance or constrain the propagation of managerial efficiency from micro to macro levels.

By emphasizing these characteristics, the model moves beyond a static or mechanistic interpretation of efficiency. It portrays economic performance as an emergent property of complex, multilevel interactions, moderated by both organizational choices and contextual conditions. The model also integrates the conceptual approaches summarized in Tables 4–5, linking strategic alignment, digital and innovation capacity, human capital development, and operational optimization to measurable outcomes across firm, sectoral, and macroeconomic levels.

In sum, the hierarchical cumulative transmission model demonstrates how enterprise-level managerial capabilities, when aligned with strategic objectives and supported by institutional conditions, progressively translate into sectoral transformation and macroeconomic stability.

The scientific novelty of the study lies in the conceptualization of management practices as a structured transmission mechanism linking micro-level organizational efficiency with macroeconomic stability. Unlike traditional approaches that treat firm performance and economic growth as analytically separate domains, the proposed framework integrates dynamic managerial capabilities, performance measurement systems, and digital transformation into a hierarchical micro–meso–macro model.

The study substantiates the cumulative, lagged, and institutionally moderated nature of the aggregation process through which firm-level efficiency transforms into sectoral productivity and ultimately influences macroeconomic outcomes. Thus, managerial quality is interpreted not only as a determinant of corporate competitiveness but also as a systemic factor contributing to structural economic resilience.

Conclusions. The conducted research confirms that economic efficiency in contemporary economies should be interpreted not as an isolated financial result, but as a systemic, multilevel phenomenon emerging from the interaction of managerial capabilities, organizational structures, digital transformation processes, human capital development, and sectoral dynamics.

The study achieved its primary objective by developing a hierarchical cumulative transmission model that explains how enterprise-level managerial approaches are progressively transformed into firm-

level economic outcomes, aggregated at the sectoral level, and ultimately reflected in macroeconomic stability and growth. The proposed framework integrates strategic management, performance measurement systems, digital and innovation practices, human capital development, and operational optimization into a coherent analytical architecture linking micro-, meso-, and macro-level processes.

Empirical analysis of Azerbaijan's macroeconomic indicators for 2020–2025 demonstrates that wage dynamics, GDP growth fluctuations, and employment structure changes can be interpreted through the lens of managerial modernization and structural adaptation. Despite the contraction in 2020 caused by the COVID-19 pandemic, the economy demonstrated recovery and adaptive capacity in subsequent years. Sustained nominal wage growth, sectoral modernization, particularly in construction and industry, and gradual productivity improvements indicate that enterprise-level efficiency processes contributed to macroeconomic stabilization. At the same time, uneven GDP growth trajectories in 2023 and 2025 confirm that macroeconomic performance remains sensitive to external pressures, energy market volatility, and structural constraints.

The findings highlight several key theoretical implications. First, efficiency gains originate at the enterprise level but become economically significant only through cumulative sectoral aggregation. Second, the transmission mechanism from managerial capabilities to macroeconomic outcomes is indirect, lagged, and institutionally moderated. Third, sustainable economic growth depends not solely on capital accumulation, but on the quality of management systems, digital maturity, and the development of human capital.

The hierarchical cumulative transmission model developed in this study possesses four defining characteristics, cumulative, lagged, conditional, and institutionally moderated, which together explain the non-linear and path-dependent nature of economic transformation. By incorporating contextual moderators such as governance quality, regulatory frameworks, and digital infrastructure, the model moves beyond deterministic cause–effect logic and provides a realistic representation of economic propagation mechanisms.

From a practical perspective, the research substantiates that long-term strategic planning, integration of digital technologies, systematic

KPI-based performance management, human capital investment, operational optimization, and effective outsourcing strategies represent key leverage points for strengthening enterprise efficiency and macroeconomic resilience.

At the policy level, supportive institutional frameworks, access to finance for medium-sized enterprises, and innovation-oriented regulation play a crucial role in accelerating the micro-to-macro transmission of efficiency gains.

The study contributes to management and economic theory by formalizing the linkage between enterprise dynamic capabilities and macroeconomic stability within a multilevel analytical structure. The proposed framework provides both a conceptual foundation for further empirical modeling and a practical guideline for enterprises and policymakers seeking to enhance sustainable economic development.

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КОНЦЕПТУАЛЬНА БАГАТОРІВНЕВА ТРАНСМІСІЙНА МОДЕЛЬ, ЩО ПОЄДНУЄ УПРАВЛІННЯ ПІДПРИЄМСТВОМ З ЕКОНОМІЧНОЮ ЕФЕКТИВНІСТЮ ТА МАКРОЕКОНОМІЧНОЮ СТАБІЛЬНІСТЮ

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Анотація. *У статті розроблено багаторівневу концептуальну управлінсько-орієнтовану модель, що пояснює ієрархічну трансмісію управлінських спроможностей підприємства в економічну ефективність та макроекономічну стабільність. Метою дослідження є систематизація сучасних управлінських підходів, які впливають на результати діяльності підприємств, а також обґрунтування кумулятивної трансмісійної моделі, що поєднує управлінські системи, результати на рівні фірми, галузеву динаміку та макроекономічні показники. У роботі інтегровано стратегічний менеджмент, системи вимірювання результативності, цифрову трансформацію, розвиток людського капіталу та операційну оптимізацію в цілісну аналітичну архітектуру. Запропоновано ієрархічну кумулятивну трансмісійну модель, яка концептуалізує чотири взаємопов'язані рівні: 1) управлінські спроможності на рівні підприємства; 2) вимірювані економічні результати діяльності фірми, зокрема продуктивність і ефективність використання капіталу; 3) галузеві агреговані ефекти; 4) макроекономічну стабільність, відображену у динаміці ВВП, заробітної плати та структурі зайнятості. Модель підкреслює кумулятивний, лаговий, умовний та інституційно модифікований характер ефектів, акцентуючи нелінійну природу поширення ефективності між рівнями економічної системи. Аналіз макроекономічних показників Азербайджану за 2020–2025 рр. демонструє, що зростання заробітної плати, галузева модернізація та підвищення продуктивності можуть інтерпретуватися як агреговані результати управлінської модернізації та цифрової трансформації на рівні підприємств. Отримані результати підтверджують, що стійка макроекономічна стабільність залежить не лише від накопичення капіталу, а й від якості стратегічного узгодження, систем вимірювання результативності, цифрової інтеграції та управління людським капіталом у межах підприємств. Запропонована модель розширює теоретичні положення менеджменту й економічної теорії шляхом формалізації мікро–, макрозв'язку та має практичне значення для підприємств і державної політики, спрямованої на посилення довгострокової економічної стійкості й конкурентоспроможності.*

Ключові слова: *багаторівнева управлінська модель; управлінські спроможності; економічна ефективність; цифрова трансформація; продуктивність праці; макроекономічна стабільність; системи вимірювання результативності; галузева агрегація.*

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