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INDUSTRIAL DEVELOPMENT IN BELARUS UNDER EXTERNAL SHOCKS: INSTITUTIONAL STRUCTURE, CONSTRAINTS, AND ADAPTATION

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Abstract

The study analyzes the industrial development of Belarus from 2015 to 2024 under consecutive external shocks, including the COVID-19 pandemic, sanctions, and persistent structural constraints. Using official statistical data and institutional analysis, the research evaluates output dynamics, investment activity, employment trends, and the role of state-affiliated enterprises. The results show that the sector demonstrated notable resilience through the reconfiguration of production and logistics chains and sustained investment, particularly in the energy segment. However, high material intensity, declining profitability, labor shortages, and structural concentration continue to limit technological upgrading and long-term competitiveness. The study contributes to the literature on industrial resilience by identifying the mechanisms of adaptation in a medium-sized, state centric economy and outlines strategic priorities for sustainable industrial development, including modernization, energy-efficiency improvements, SME support, and export diversification.

Keywords: *industry of Belarus, industrial production index, manufacturing, investment, profitability, labor resources, material intensity, structural changes, energy sector, industrial policy*

Introduction

The industrial sector of the Republic of Belarus remains a central pillar of the national economy, shaping production dynamics, export performance, and employment (Belstat, 2024; World Bank, 2023). During 2015–2024, its development unfolded amid substantial external turbulence–from the aftermath of the mid-2010s recession and the COVID-19 pandemic to the large-scale sanctions pressure of 2022 (IMF, 2023; Bertelsmann Stiftung, 2024) and the subsequent restructuring of foreign economic relations. These shocks produced heterogeneous output dynamics, disrupted established production chains, and altered the relative roles of individual industries (EBRD, 2024). Such conditions make a comprehensive analysis of this period particularly relevant.

Scientific research on industrial development in Belarus and the EAEU countries is concentrated around several key areas (Shutsilin et al., 2021; Ustinovich et al., 2024).

The literature provides detailed examinations of structural changes in industry, the impact of macroeconomic factors and external shocks, and emphasizes the need for modernization and increased sectoral resilience (Sidarava, 2023; Zatalhutskaya & Fedziunio, 2023). Significant attention in the literature is devoted to enterprise-level efficiency and profitability, cost structures, and the material intensity of production (OECD, 2024), all of which continue to constrain industrial growth. Another substantial body of research examines innovation activity and technological development, emphasizing the low rate of new technology adoption and the strong dependence on imported equipment (UNECE, 2022). A considerable number of studies also analyze the effects of sanctions, shifts in logistics, and the reorientation of export flows (World Bank, 2023; UNCTAD, 2024b). In addition, scholars highlight the role of the state and large industrial holdings, which shape the structure of industrial output and largely determine the system's overall adaptability.

Although the existing body of research is extensive, most studies address isolated dimensions of industrial development – such as enterprise efficiency, innovation performance, sanctions-related disruptions, ownership transformations, or labor-market dynamics – rather than examining the industrial system in an integrated manner (EBRD, 2022). Holistic assessments that encompass the full 2015–2024 period and account for the cumulative impact of multiple, sequential external shocks remain comparatively scarce. This limitation highlights the need for a comprehensive analysis capable of capturing both the structural evolution and the adaptive capacity (OECD, 2023) of the industrial sector. The present study responds to this gap by offering a systematic examination of the dynamics, structural characteristics, and resilience mechanisms of Belarus's industry under conditions of persistent external constraints and internal structural pressures.

Materials and Methods

The study draws on official statistical data from Belstat (Belstat, 2024) and sectoral reports for 2015–2024 and employs descriptive statistics, structural and comparative analysis, as well as trend evaluation of key industrial indicators, including output dynamics, employment, investment, profitability, and cost structure. The methodological approach integrates macro-level quantitative assessment with an institutional analysis of ownership patterns and the role of state-affiliated holdings (Bertelsmann Stiftung, 2024; EBRD, 2022), enabling a comprehensive examination of industrial resilience under consecutive external shocks and persistent internal structural constraints.

Results

In 2015–2024, the industrial sector of the Republic of Belarus followed a complex yet generally upward development trajectory, passing through several structural phases: recovery after the mid-2010-s crisis, adaptation to pandemic-related restrictions, the sharp sanctions shock of 2022, and subsequent recovery in 2023–2024. The industrial production index shows that after the decline in 2022 (94.6% year on year), the sector not only compensated for the losses but also entered a phase of stable growth – 107.7% in 2023 and 105.4% in 2024 (Belstat, 2024). This indicates high adaptability of production chains and the ability of enterprises to rapidly restructure sales markets and logistics.

The total volume of industrial output in current prices demonstrates significant growth; however, its interpretation requires accounting for inflation and changes in the price environment. The physical volume index provides a more accurate picture, confirming the sector's recovery and strengthening in the final two years of the analyzed period.

The number of industrial organizations increased from 15.9 thousand in 2015 to 17.4 thousand in 2024 (Belstat, 2024). Growth was particularly notable in 2023–2024, reflecting rising entrepreneurial activity, expansion of the small and micro enterprise segment, and changes in statistical methodology (inclusion of temporarily inactive organizations).

Manufacturing consistently accounts for around 90% of national industrial output. In 2023–2024, it became the main driver of recovery: the physical volume index reached 109.1% and 105.5%, respectively (Belstat, 2024). The sector is characterized by high employment (84–85% of industrial workers) and stable profitability, although the profit margin

declined from 12.0% in 2022 to 8.7% in 2024, reflecting rising costs and external pressures.

The electricity, gas, steam, and hot water supply sector exhibits moderate yet consistently stable development. Its share in total industrial output declined from 10% in 2015 to 7% in 2024; however, investment in fixed assets increased substantially, contributing to lower asset depreciation and strengthening the sector's infrastructural foundation. These improvements create favorable conditions for the further expansion of the energy sector as a critical pillar supporting long-term industrial growth.

The water supply, waste management, and pollution remediation sector maintains a stable share of 1.6–1.7% and shows moderate growth in physical output. It remains labor-intensive and characterized by relatively low wages, yet it possesses development potential within the broader framework of ecological modernization.

The mining sector accounts for a small share of industrial output (1.1–1.4%) but is characterized by pronounced volatility in financial performance and the highest level of fixed asset depreciation (around 59%). At the same time, wages in the sector significantly exceed the industrial average, reflecting its high capital intensity and the complexity of extraction operations.

Numerically, the private sector dominates industry (92% of firms), though its output is outweighed by state-linked companies–which, despite being just 2–3% of firms, generate nearly half of total output. Enterprises with foreign capital play a minor role (5.8–6.5%) and have contributed less since 2021 following investor departures. Industrial employment declined from 936.8 thousand in 2015 to 833 thousand in 2022, showing a modest recovery thereafter amid demographic shifts, migration flows, and increasing automation. By 2024, net hiring had reached 102.4%, indicating rising labor demand and persistent worker shortages.

Industrial wages consistently exceeded the national average (105.8% in 2024), reinforcing the sector's attractiveness for employees. The highest wages were recorded in mining (167% of the industrial average), while the lowest were observed in the utilities sector.

Industrial profit margins peaked in 2022 (10.8%) before declining to 8.3% in 2024, with a similar pattern in manufacturing. This trend reflects rising production costs and limited opportunities for price adjustments. Profit from product sales stabilized in 2023–2024 but did not increase despite higher physical output, confirming a continued pattern of margin compression.

The value of fixed assets in Belarusian industry doubled between 2021 and 2025, reflecting large-scale investment and asset revaluation. The most intensive renewal is observed in the energy sector, where the share of depreciation in production costs increased while asset wear declined.

The cost structure of industrial production remains stable: material costs account for 74–78% of total expenses, confirming the material-intensive nature of Belarusian industry. Labor costs represent 10–12%, and depreciation 5–6%. Such a structure limits the potential for rapid productivity growth and underscores the need for technological modernization.

Discussion

The results of the analysis of Belarusian industrial development significantly expand our understanding of the mechanisms of industrial resilience under long-term external shocks and confirm that the adaptation process represents a more complex and multi-level system than is reflected in existing theoretical models. International studies emphasize that economies characterized by high material intensity, limited technological development, and the dominance of state-owned and affiliated enterprises tend to be more vulnerable to external constraints (OECD, 2024; UNIDO, 2024). However, the trends identified in the study show that Belarus's industrial sector has developed adaptive mechanisms that helped mitigate the impact of sanctions, logistical disruptions, and pandemic-related restrictions.

First, the recovery of the industrial production index in 2023–2024 demonstrated the ability of enterprises to rapidly reconfigure their production and distribution chains. This observation is significant for the international discussion on industrial resilience, as it confirms that effective compensatory strategies are possible even under limited access to technology and external markets. Unlike the typical scenarios described in EBRD and

World Bank studies, the adaptation of Belarusian enterprises was driven not only by cost reduction but also by logistics reorientation, the search for new markets, and the partial restoration of export flows.

Second, the institutional structure of the industrial sector exhibited a dual nature. Proponents of classical and neoclassical economic theory traditionally view the high concentration of assets in state-owned holdings as a factor that limits innovation dynamics and flexibility (EBRD, 2022; Sidarava, 2023). However, the results of the study show that this structure ensured the resilience of key production segments under sanctions pressure. Thus, the institutional configuration performed not only a constraining but also a stabilizing function, refining existing understandings of the state's role in industrial adaptation and requiring a reconsideration of several theoretical assumptions.

Third, the identified structural constraints – high material intensity, declining profitability, and labor shortages – confirm international organizations' conclusions about long-term risks for economies with limited technological modernization (UNECE, 2022; OECD, 2023). The observed decline in profit margins alongside growing physical output suggests that Belarusian industries predominantly adjust through existing technological systems rather than achieving substantial increases in efficiency or productivity. This highlights the necessity of transitioning from immediate responses to proactive strategies aimed at comprehensive modernization aligned with global guidelines for sustainable industrial development.

Conclusion

The analysis shows that Belarus's industrial sector demonstrated notable resilience during 2015–2024, successfully adapting to pandemic-related disruptions, sanctions, and long-standing structural constraints. Output recovery in 2023–2024, the stable role of manufacturing, and sustained investment–especially in the energy segment–confirm the sector's capacity to maintain growth under adverse external conditions. At the same time, persistent systemic challenges, including high material intensity, declining profitability, labor shortages, and the structural dominance of large enterprises, continue to limit technological renewal and long-term competitiveness. Ensuring sustainable development requires a transition from reactive adaptation to proactive modernization. Key priorities include technological upgrading, improvements in energy efficiency, expansion of SME participation, infrastructure renewal, and diversification of export and logistics channels. The findings highlight the need for a comprehensive industrial strategy capable of strengthening resilience and supporting long-term structural transformation.

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