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The Impact Mechanism of Enterprise Digital Transformation on New Quality Productivity – Mediating Role of Technological Innovation and Resources Allocation

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Introduction

In an era of rapid technological advancement, against the backdrop of technological revolution and resource constraints, the digital transformation of enterprises and the cultivation of new quality productive forces are mutually reinforcing, jointly constituting the core driving force for promoting high-quality economic development. Centered on breaking through traditional growth models, new quality productive forces leverage digitalization to achieve deep integration of technology and industry, reconstructing production systems that are efficient, high-quality, and green. This transformation serves as a strategic key to overcoming development bottlenecks, reshaping growth drivers, and enhancing global competitiveness.

Research Questions

1) Does enterprise digital transformation have a significant positive impact on new quality productivity?
2) Does technological innovation play a mediating role in the process of enterprise digital transformation enhancing new quality productivity?
3) Does optimized resource allocation play a mediating role in the process of enterprise digital transformation enhancing new quality productivity?

Table

TABLE Summary of Key Variables

Variables	Description	Symbol	Definition
Dependent Variable	New Quality Productivity	NQP	Total asset turnover ratio (TATR)
Independent Variable	Enterprise Digital Transformation	EDT	AI*0.18+Blockchain*0.36+Cloud computing*0.28+Big data*0.18
Mediating Variable	Technological Innovation	TI	R&D personnel*0.31+highly educated employees*019+intangible assets*0.5
	Resource Allocation	RA	fixed assets*0.5+manufacturing costs*0.5
Control Variable	Industry Type	ITyp	Enterprise industry type
	Region	Reg	Region
	Enterprise Ownership Nature	ESN	Enterprise ownership nature
	Year	Year	Year fixed effects

Mathematical Formulas

$$NQP_{it} = \alpha_0 + \alpha_1 EDT_{it} + \sum \alpha_i Control_{it} + \sum Year + \varepsilon_{it} \quad (1)$$

$$TI_{it} = \beta_0 + \beta_1 EDT_{it} + \sum \beta_i Control_{it} + \sum Year + \varepsilon_{it} \quad (2)$$

$$NQP_{it} = \delta_0 + \delta_1 EDT + \delta_2 TI_{it} + \sum \delta_i Control_{it} + \sum Year + \varepsilon_{it} \quad (3)$$

$$RA_{it} = \gamma_0 + \gamma_1 EDT_{it} + \sum \gamma_i Control_{it} + \sum Year + \varepsilon_{it} \quad (4)$$

$$NQP_{it} = \theta_0 + \theta_1 EDT + \theta_2 RA_{it} + \sum \theta_i Control_{it} + \sum Year + \varepsilon_{it} \quad (5)$$

Methodologies

By constructing measurement indicators for enterprise digital transformation (EDT), new quality productivity (NQP), technological innovation (TI), and resource allocation (RA), this paper uses a benchmark regression model to test the direct impact of EDT on NQP, employs a mediating effect model to verify the mediating role of TI and RA, and conducts robustness tests. It provides a reference for high-quality development.

Conclusion

Based on the data of Chinese A-share listed companies from 2019 to 2023, the paper draws the following conclusions through constructing relevant measurement indicators and conducting empirical analysis:

EDT significantly enhances NQP. In the benchmark regression, the coefficient of EDT is significantly positive under various models. EDT affects NQP through two paths: TI and RA. Specifically, EDT strengthens TI capabilities and indirectly promotes the improvement of NQP through TI. Meanwhile, EDT can optimize RA and reduce costs, and indirectly drive the growth of NQP through the optimization of RA. The above conclusions are verified by robustness tests, providing a reference for promoting digital transformation, accelerating the development of NQP and high-quality economic growth.