

Research on the Influence Mechanism of New-Quality Productive Forces on High-Quality Full Employment

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Abstract

As the core "dual engines" driving high-quality economic development, new-quality productive forces and high-quality full employment are of great theoretical and practical significance for advancing the national high-quality development strategy, and the study on their influence mechanism is particularly important. Based on this, this paper takes the panel data of 31 provinces in China from 2016 to 2023 as the research sample and constructs a systematic empirical analysis framework: first, the Criteria Importance Though Intercriteria Correlation (CRITIC) method is adopted to measure the new-quality productive forces index and high-quality full employment index from the perspective of a multi-dimensional indicator system, so as to ensure the objectivity and scientificity of the measurement results; second, on the basis of selecting control variables, a two-way fixed effects model is used to empirically test the influence mechanism of new-quality productive forces on high-quality full employment, endogeneity treatment is conducted through the instrumental variable method, and robustness tests are carried out by replacing core explanatory variables and adjusting the sample interval to ensure the reliability of the research conclusions; finally, combined with the realistic background of unbalanced development between eastern and western China, a regional heterogeneity analysis is carried out to reveal the regional difference characteristics of the influence mechanism. The empirical results show that: first, new-quality productive forces have a significant positive driving effect on high-quality full employment, and they are the key driving force for expanding employment scale, optimizing employment structure and improving employment quality; second, this driving effect has obvious regional heterogeneity- in the eastern region with a more solid economic foundation and more concentrated innovative factors, the employment-driven efficiency of new-quality productive forces is significantly higher than that in the central and western regions; third, sudden events represented by the COVID-19 pandemic in 2019 have not had a subversive impact on the core influence mechanism between new-quality productive forces and high-quality full employment. Based on the above conclusions, this paper provides targeted policy suggestions for relevant departments from the dimensions of differentiated regional development strategies and employment policy coordination.

Keywords

New-Quality Productive Forces; High-Quality Full Employment; Two-Way Fixed Effects Model; CRITIC Method.

1. Introduction

Under the dual context of in-depth adjustments in the global economic structure and the accelerated evolution of the unprecedented changes in the world in a century, China's economic development is facing multiple external shocks, such as growing trade protectionism, escalating

technological blockades, and the restructuring of global value chains. Domestically, the employment sector presents a complex situation with intertwined total pressure and structural contradictions-accelerated industrial upgrading and technological transformation have further highlighted deep-seated issues in the labor market, including supply-demand mismatches and quality imbalances. At this critical juncture, the fourth wave of the scientific and technological revolution, centered on artificial intelligence and quantum computing, is sweeping the globe. It not only reshapes global competition rules but also provides China with a historic opportunity to break external constraints, realize the shift from old to new growth drivers, advance industrial upgrading, and transform development models. New-quality productive forces are the core embodiment of this revolution in the field of productive forces. From the perspective of national strategic orientation, the coordinated advancement of new-quality productive forces development and high-quality full employment has become a key proposition for economic and social development in the new era. However, a notable reality is that the connection mechanism between new-quality productive forces development and high-quality full employment has not yet been fully established, the enabling effect of technological progress on employment quality improvement has not been fully unleashed, and the lag in theoretical research and practical exploration urgently needs to be addressed.

Current academic research on new-quality productive forces mainly focuses on their historical positioning, theoretical essence, and macro-micro impacts. Based on the general laws of productive forces evolution, Xie Yize [1] systematically analyzed the historical coordinates and development trends of new-quality productive forces, dividing the evolution of human society's productive forces into four stages: primitive productive forces, manual productive forces, machine productive forces, and digital productive forces. From the perspective of historical materialism, Tao Li [2] deeply expounded the theoretical core of new-quality productive forces, summarizing it into three characteristics-"new technology", "new media", and "new materials"-and further refined its essential attributes as "advanced nature", "digital nature", and "ecological nature". Combining the new development philosophy and ecological civilization concept, He Shuqi [3] used the political economy analysis method to clearly propose that "new-quality productive forces themselves are green productive forces", enriching the theoretical connotation of new-quality productive forces. Focusing on the micro-practical level, Zuo Longxia [4] pointed out that enterprises can promote digital transformation by virtue of new-quality productive forces means such as technological innovation, data factor empowerment, and intelligent management, and systematically sorted out the theoretical logic, practical dilemmas, and practical paths in this process. Further research by Li Haixia and Du Jinzhu [5] shows that new-quality productive forces significantly promote industrial structure upgrading, and the transmission path with technological innovation as the core mediating variable will lead to obvious spatial spillover effects. Based on the perspective of factor mobility, Tong Jiecheng et al. [6] found through empirical research that labor market integration can affect the development of enterprises' new-quality productive forces through three paths-knowledge spillover, innovation incentives, and efficiency improvement-and that talent policies play an indirect moderating role in the above process. Zhou Jie and Zang Dundang [7] focused on the enabling value of financial technology, proposing to strengthen the support of financial technology for the real economy, thereby providing impetus for the construction of a modern industrial system to systematically promote the development of new-quality productive forces. Research by Lin Likui et al. [8] proves that the application of artificial intelligence can effectively alleviate the inhibitory effect of population aging on new-quality productive forces, and points out that tapping the potential of the labor market through human capital development is the core path to building a new-quality productive forces system with age-appropriate transformation and higher development resilience.

In the research field of high-quality full employment, domestic scholars have achieved rich results and conducted explorations from multiple dimensions. Focusing on the new trends and characteristics of the labor market, with market demand as the core orientation, Chen Yan and Li Jian [9] analyzed the adaptability between the current talent training system and market demand from the perspective of the talent supply side, and further proposed practical paths to optimize the talent training model for promoting high-quality full employment. From both micro-individual and macro-institutional perspectives, Yue Changjun [10] systematically explained the connotation of high-quality full employment, clearly pointing out that employability is one of the core elements of talent training, and emphasized that the coordinated efforts of an effective market and a capable government are needed to provide institutional guarantees and a market environment for high-quality full employment. Lai Desheng [11] systematically sorted out the historic achievements made in China's employment field since the 18th National Congress of the Communist Party of China, deeply demonstrated the strategic significance of realizing high-quality full employment for economic and social development, and put forward suggestions on the in-depth integration of the employment-first policy and the social security system. Based on the employment-related policy documents released by the government over the years, Lu Yuexiang, Liang Zhanyong and Qiu Kangquan [12] constructed a multi-dimensional evaluation system for high-quality full employment level. They then used quantitative analysis methods such as the entropy weight method to analyze the overall characteristics and regional differences of China's employment situation from the dual perspectives of spatial distribution and temporal evolution, providing important empirical references for improving the national employment level in the follow-up. Jia Zhuoqiang [13] pointed out that although the digital economy has optimized the employment skill structure and industrial structure and promoted the expansion of employment scale on the whole, it still cannot avoid the problems of technological unemployment and widening income gap. After systematically sorting out China's employment policies since the founding of the People's Republic of China in 1949, Li Zhiming [14] pointed out that the contractualization of labor employment relations is an inevitable trend of the socialist market economic system, and the government needs to play a core guiding role in promoting full employment. Chen Jianwei [15], however, emphasized that the development of flexible employment and new employment forms puts forward higher requirements for the protection of workers' rights and interests. It is necessary to help realize high-quality employment and meet the people's aspiration for a better life by clarifying the boundary between labor relations and quasi-labor relations, strengthening the guarantee of wage payment, improving the coverage of social insurance rights and interests, and activating the functions of trade unions at all levels.

Looking at the existing research, while academic research on either new-quality productive forces or high-quality full employment has been relatively in-depth, studies that combine the two and systematically explore the influence mechanism and effect intensity of new-quality productive forces on high-quality full employment remain relatively scarce. In particular, there is a lack of systematic research that integrates "theoretical mechanism-empirical test-heterogeneity analysis". This research gap not only restricts the improvement of the theoretical system of the social effects of new-quality productive forces, but also makes it difficult for policy makers to accurately grasp the core logic of the coordinated development of the two and formulate targeted policy tools. Based on this, this paper takes the panel data of 31 provinces in China (excluding Hong Kong, Macao and Taiwan regions) from 2016 to 2023 as the research sample, and constructs a complete empirical framework of "core indicator measurement-benchmark regression test-endogeneity treatment-robustness verification-heterogeneity analysis". It focuses on clarifying the transmission path of new-quality productive forces affecting high-quality full employment, accurately identifying its influence effect and boundary conditions, and providing theoretical support and empirical basis for solving structural

employment contradictions. The research significance and marginal contributions of this paper are mainly reflected in the following aspects: At the theoretical level, it mainly breaks through the limitation of "isolated discussion" in existing research, constructs an integrated analysis framework of "new-quality productive forces-transmission mechanism-high-quality full employment", clarifies key transmission paths such as technological progress, industrial upgrading and factor restructuring, enriches the theoretical system of the social effects of new-quality productive forces and the employment-driven mechanism, and provides a new analytical perspective for the integrated development of Marxist productive forces theory and employment theory. At the practical level, it innovatively adopts the CRITIC method (an objective weighting method based on the variation degree and conflict degree of indicators) to construct an evaluation index system for new-quality productive forces and measure the index from three dimensions: "new-type laborers, new-type means of labor, new-type objects of labor". At the same time, it constructs a high-quality full employment index from three levels: "employment adequacy, employment stability, employment return rate". On this basis, it uses the two-way fixed effects model to test the core influence effect, combines the instrumental variable method to handle endogeneity issues, and conducts robustness verification by replacing core indicators and adjusting the sample interval. Furthermore, it conducts heterogeneity analysis with the COVID-19 pandemic in 2019 as the temporal cutoff point and the median level of new-quality productive forces development as the spatial cutoff point, accurately identifying the effect differences in different scenarios, and providing a scientific basis for formulating differentiated regional policies and constructing a linkage mechanism of "new-quality productive forces cultivation-employment quality improvement".

2. Research Hypotheses and Methodology Design

2.1. Research Hypotheses

Based on the theory of technology reshaping job characteristics, technology reshapes employee experience and performance through a chain mechanism of "technology intervention-characteristic change-outcome output" by altering core job dimensions such as skill variety and task autonomy. New-quality productive forces, with artificial intelligence and automation as core supports, will inevitably bring about systematic reconstruction of traditional job characteristics, thereby exerting profound impacts on employment scale, structure, and quality from three dimensions. Zhu Chen, Wang Zekai, and Zhang Kangsi [16] point out that the development of new-quality productive forces not only changes production processes but also significantly reduces dependence on manual labor, promoting the transformation of job characteristics from "labor-intensive" to "skill-intensive". From the perspective of employment forms, Yang Haoyue and Chen Li [17] propose that new-quality productive forces, relying on the flexible employment mechanism built by the sharing economy and platform economy, provide workers with diversified employment options and accelerate the improvement of labor market flexibility and mobility; workers can dynamically adjust their employment behaviors according to market signals, thereby achieving the dual goals of skill-job matching and work-life balance. Furthermore, the development of new-quality productive forces also promotes the improvement of the employment policy system: In response to issues such as structural unemployment caused by technological progress and rights protection of new employment forms, the employment-first policy during the 14th Five-Year Plan period has established a policy system covering fiscal incentives, tax and fee reductions, and financial support, and enhances workers' job adaptability through special training in digital skills, effectively alleviating the contradiction of skill mismatch. Based on the above analysis, this paper proposes the core hypotheses:

H1: New-Quality Productive Forces exert a significant positive promoting effect on the high-quality full employment of the labor force.

On the other hand, the empirical study by Lu Jiang, Guo Ziang, and Wang Yuping [18] shows that in recent years, the level of China's new-quality productive forces has continued to rise, with the national overall level increasing by 1.89 times and the average annual growth rate stabilizing at around 21%, demonstrating phased breakthroughs in China's scientific and technological innovation field. However, from the perspective of spatial distribution, the development of new-quality productive forces across provinces presents significant regional heterogeneity, showing a pattern of "eastern regions leading, central and western regions following, and internal hierarchical differentiation within regions". The formation of this difference stems from the fact that eastern regions have advantages in the agglomeration of factors such as technology, talents, and capital, and possess a solid industrial foundation for developing new-quality productive forces; central regions are constrained by multiple factors including geographical location, industrial hierarchy, and scientific and technological strength, resulting in a development speed lagging behind the east; western regions, due to inadequate infrastructure and limited ability to attract innovative factors, have a relatively slow overall development process. The study by Ru Jiachen and Ma Yongbin [19] further supplements empirical evidence for regional differences. By constructing a comprehensive evaluation index system and combining the entropy weight-TOPSIS method to measure and rank the level of new-quality productive forces in 30 provincial-level regions of China from 2012 to 2021, they found that the development speed of new-quality productive forces in Northeast China was lower than the national average, a phenomenon closely related to the lagging industrial transformation of old industrial bases. The regional development imbalance of new-quality productive forces implies that their promoting effect on high-quality full employment may have spatial heterogeneity. Based on this, this paper proposes the extended hypothesis:

H2: There exist regional differences in the positive promoting effect of New-Quality Productive Forces on the high-quality full employment of the labor force.

2.2. Methodology Design

Regarding the construction of the New-Quality Productive Forces indicator system, a consensus has basically been reached in the academic community, namely: New-Quality Laborers, New-Quality Means of Labor, and New-Quality Objects of Labor. This paper constructs an evaluation system based on relevant indicators of New-Quality Productive Forces to quantify the development level of each province. In selecting evaluation indicators, reference is made to the practices of Wang Zifeng & Zhang Guiwen [20] and Shi Shuhua et al. [21], while fully considering the scientificity, comprehensiveness, and availability of the indicators, thus establishing the New-Quality Productive Forces evaluation indicator system (see Table 1). New-Quality Laborers typically have a sound educational background, high scientific literacy, and a good academic level. This paper constructs indicators for measuring labor quality from internal and external perspectives: at the external level, government expenditure on science and technology and education is selected as core factors; at the internal level, the number of college and university students in school is used as an observation variable to comprehensively reflect the quality of laborers. Means of Labor refer to various material materials and material conditions used by laborers to transform or influence Objects of Labor in the labor process. As an evolved form of traditional Means of Labor, New-Quality Means of Labor can be divided into two aspects: material and intangible. In terms of material means of production, it mainly covers infrastructure indicators such as the number of Internet broadband users, the number of mobile phone users, and the length of optical fiber cable lines—these indicators serve as the material foundation for the emergence and development of New-Quality Productive Forces. In terms of intangible means of production, three core indicators (output value of the digital

economy, number of national key laboratories, and number of granted patents) are included, which can intuitively reflect the development status and potential of New-Quality Productive Forces in a specific region. New-Quality Objects of Labor are new types of labor processing objects emerging with the new technological revolution and industrial upgrading, whose core connotation focuses on two major fields: new energy and new industries. Among them, the measurement of new energy is carried out from two dimensions: power generation and utilization. The new energy power generation dimension includes quantitative indicators such as solar power generation and wind power generation; the new energy utilization dimension selects forest coverage rate and government environmental protection expenditure as observation indicators to characterize the potential development value of new energy. The measurement of the new industry dimension mainly relies on two key indicators: the development level of high-tech industries (or strategic emerging industries) and R&D (Research and Development) expenditure. The finally constructed indicator system is shown in Table 1 below:

Table 1. Evaluation Indicator System for New-Quality Productive Forces

First-Level Indicator	Second-Level Indicator	Third-Level Indicator	Attribute	Unit
New-Quality Laborers	Science and Technology Input	Government Science and Technology Expenditure	Positive	100 Million Yuan
	Education Input	Government Education Expenditure	Positive	100 Million Yuan
	Higher Education	Number of Enrolled Students in Higher Education Institutions	Positive	10 Thousand Persons
New-Quality Means of Labor	Material Means of Production	Number of Internet Broadband Users	Positive	10 Thousand Persons
		Number of Mobile Phone Users	Positive	10 Thousand Persons
		Length of Optical Fiber Cable Lines	Positive	10 Thousand Kilometers
	Intangible Means of Production	Digital Economy Output Value	Positive	Trillion Yuan
		Number of National Key Laboratories	Positive	Unit
		Number of Granted Patents	Positive	Piece
New-Quality Objects of Labor	New Energy	Forest Coverage Rate	Positive	%
		Government Environmental Protection Expenditure	Positive	100 Million Yuan
		Solar Power Generation	Positive	100 Million Kilowatt-Hours
		Wind Power Generation	Positive	100 Million Kilowatt-Hours
	New Industries	Revenue of High-Tech Industries	Positive	100 Million Yuan
		R&D Expenditure	Positive	100 Million Yuan

For High-Quality Full Employment, which covers two core dimensions-"high quality" and "full employment"-its complexity means it cannot be fully measured by a single indicator system. This paper draws on the research framework of Chu Xiwei and Wang Jingbo [22] to construct a

comprehensive evaluation system including two subsystems: Full Employment and High-Quality Employment (see Table 2 for details). The evaluation of High-Quality Employment covers three dimensions: employability, employment remuneration, and social security. For the employability dimension, total social labor productivity and the number of graduates from institutions of higher education are selected as core indicators. These two indicators directly characterize the quality of laborers and reflect the human capital reserve level of the labor market. For the employment remuneration dimension, the nominal growth rate of employee compensation and average salary are included. This dimension is directly related to laborers' job satisfaction and career expectations, and is a key factor in measuring employment quality. For the social security dimension, the number of participants in unemployment insurance, endowment insurance, and medical insurance serves as the measurement basis. It not only reflects the government's bottom-line responsibility in people's livelihoods, but also shows the market's efforts to protect laborers' legitimate rights and interests. The evaluation of Full Employment includes three key dimensions: unemployment level, employment opportunities, and employment structure. The urban unemployment rate is the only negative indicator—the lower its value, the stronger the employment adequacy. The employment opportunities dimension covers the number of newly created jobs and the number of registered enterprises. These two indicators jointly characterize the growth trend of employment opportunities and are important reflections of labor market vitality. The employment structure dimension takes the number of employees in the three major industries as the core indicator. It not only directly reflects the stage of national economic development and the characteristics of core competitiveness, but also serves as a key link connecting employment adequacy and economic structure adaptability.

Table 2. Evaluation Indicator System for High-Quality Full Employment

First-Level Indicator	Second-Level Indicator	Third-Level Indicator	Attribute	Unit
High Quality	Employability	Total Social Labor Productivity	Positive	Yuan/Person
		Number of Graduates from Higher Education Institutions	Positive	10 Thousand Persons
	Employment Remuneration	Nominal Growth Rate of Employee Compensation	Positive	%
		Average Salary of Employees	Positive	Yuan
	Social Security	Number of Participants in Unemployment Insurance	Positive	10 Thousand Persons
		Number of Participants in Pension Insurance	Positive	10 Thousand Persons
		Number of Participants in Medical Insurance	Positive	10 Thousand Persons
Full Employment	Unemployment Rate	Urban Unemployment Rate	Negative	%
	Employment Opportunities	Number of Newly Created Jobs	Positive	10 Thousand Jobs
		Number of Registered Enterprises	Positive	10 Thousand Enterprises
	Employment Structure	Number of Employees in Primary Industry	Positive	10 Thousand Persons
		Number of Employees in Secondary Industry	Positive	10 Thousand Persons
		Number of Employees in Tertiary Industry	Positive	10 Thousand Persons

For the measurement of new-quality productive forces and high-quality and full employment, this paper adopts the CRITIC method. The following is its mathematical principle. Specifically, as an objective weight assignment method, the core of the CRITIC method is to determine weights based on the "information content" (degree of variation) and "conflict degree" (degree of correlation) inherent in the indicators themselves, thereby avoiding biases caused by subjective judgments. For panel data $X = (x_{ij})_{n \times m}$ (n denotes the number of samples, m denotes the number of indicators), the CRITIC method is applied to the indicators of new-quality productive forces and high-quality and full employment through the following steps:

Step 1: Conduct standardization on the original data to eliminate the influence of dimensions, and let the standardized data be Z_{ij} :

$$\begin{aligned}
 Z_{ij} &= \frac{x_{ij} - \min(X_j)}{\max(X_j) - \min(X_j)} \text{ (Positive indicator)} \\
 Z_{ij} &= \frac{\max(X_j) - x_{ij}}{\max(X_j) - \min(X_j)} \text{ (Negative indicator)}
 \end{aligned}
 \tag{1}$$

Here, $\max(X_j)$ and $\min(X_j)$ denote the maximum and minimum values of the j -th indicator, respectively.

Step 2: Calculate the coefficient of variation of the indicators V_j to reflect the information content.

$$\begin{aligned}
 V_j &= \frac{S_j}{X_j} \\
 S_j &= \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_{ij} - \bar{X}_j)^2} \\
 \bar{X}_j &= \frac{1}{n} \sum_{i=1}^n x_{ij}
 \end{aligned}
 \tag{2}$$

Here, S_j is the standard deviation of the j -th indicator, and \bar{X}_j is the mean of the j -th indicator.

Step 3: Calculate the conflict degree of the indicators C_j to reflect the differences between the indicators.

$$C_j = \sum_{k=1}^m (1 - r_{jk})
 \tag{3}$$

Here, r_{jk} represents the correlation coefficient between the j -th indicator and the k -th indicator, and m denotes the total number of indicators.

Step 4: Calculate the indicator weights W_j to integrate information content and conflict degree.

$$W_j = \frac{V_j \times C_j}{\sum_{j=1}^m (V_j \times C_j)} \tag{4}$$

After completing the above operations, the control variables are subjected to normalization to facilitate data comparison and avoid numerical calculation issues.

Subsequently, all variables involved in the analysis of the impact mechanism are uniformly described as follows: (1) Explained Variable: High-quality and full employment (Employ), whose result is calculated comprehensively based on the various indicators mentioned above, with a larger value of Employ indicating a higher quality and greater sufficiency of employment in the region; (2) Explanatory Variable: New-quality productive forces (Force), whose result is calculated comprehensively based on the various indicators mentioned above, with a larger value of Force representing a higher development level of new-quality productive forces in the region; (3) Control Variables: Economic development level (Economy), urbanization process (Urban), government intervention (Govern), degree of external connection (Open), crowding-out effect (Crowd), and aging (Aging), among which the economic development level (Economy) is measured by per capita Gross Domestic Product (GDP) to reflect the quality of life and economic well-being of residents in a specific region; the urbanization process (Urban) is characterized by the urbanization rate to measure the comprehensive development level of urban construction in the region; the degree of government intervention (Govern) is quantified by the total fiscal expenditure to reflect the government’s policy support in promoting infrastructure construction, stabilizing the labor market, and safeguarding people’s livelihoods; the degree of external connection (Open) represents the closeness of the connection between a specific region and the global economic system and is used to measure the level of external resources and technological support obtained for the development of new-quality productive forces; the crowding-out effect (Crowd) is measured by population density to reflect the intensity of job competition in the labor market within the region; and aging (Aging) takes the proportion of the non-labor-age population in the region as an indicator to measure the burden imposed by the region’s population structure on social elderly care, medical care, and sustainable economic development, with the specific definitions of the variables shown in Table 3 below.

Table 3. Variable Setting Table

Variable Type	Variable Symbol	Meaning
Explained Variable	Employ	High-quality and Full Employment
Explanatory Variable	Force	New-quality Productive Forces
Control Variable	Economy	Per capita GDP
	Urban	Urbanization Rate
	Govern	Total Fiscal Expenditure
	Open	Total Import and Export
	Crowd	Population Density
	Aging	Proportion of Population Aged 60 and Above

Finally, to examine the impact of new-quality productive forces on high-quality and full employment, this paper establishes the following panel two-way fixed effects econometric model:

$$Employ_{it} = \alpha_0 + \beta_0 Force_{it} + \gamma Z_{it} + \mu_i + year_i + \varepsilon_{it} \tag{5}$$

Here, $Employ_{it}$ and $Force_{it}$ denote the level of high-quality and full employment of the labor force and the development level of new-quality productive forces in region i in year t , respectively; Z_{it} represents a series of control variables; μ_i and $year_i$ stand for regional fixed effects and year fixed effects, respectively; and ε_{it} is the random error term.

3. Empirical Analysis

3.1. Data Sources and Preprocessing

This paper uses panel data from 31 provinces in China (excluding Hong Kong, Macao and Taiwan) for the period 2016-2023. High-quality and full employment is taken as the explanatory variable, and new-quality productive forces as the explained variable. Additionally, it also controls for the potential impacts of economic development level (Economy), urbanization process (Urban), government intervention (Govern), degree of external connection (Open), crowding-out effect (Crowd), and aging (Aging) on high-quality and full employment and new-quality productive forces. All data are sourced from the National Bureau of Statistics of China (NBSC), Statistical Yearbooks of Various Provinces, China Population and Employment Statistical Yearbook, and relevant news reports.

Based on the descriptive statistics results of each variable (see Table 4), the following conclusions can be drawn: the standard deviation of aging degree (Aging) is 0.7350, indicating significant differences in the proportion of elderly population among different provinces; the mean value of government intervention (Govern) is 0.3163, which is the highest among control variables, reflecting strong policy support in China; the standard deviations of new-quality productive forces (Force) and high-quality and full employment (Employ) are 0.1349 and 0.1382 respectively-their small values reflect that the development of both has strong concentration and stability.

Table 4. Descriptive Statistics of Variables

Variable Symbol	Observations	Mean	Std.Dev	Min	Max
Economy	248	0.1286	0.0928	0	1
Urban	248	0.0569	0.0624	0	1
Govern	248	0.3163	0.2038	0	1
Open	248	0.1411	0.2135	0	1
Crowd	248	0.1638	0.2485	0	1
Aging	248	0.0173	0.7350	0	1
Employ	248	0.7306	0.1349	0.5375	1.2185
Force	248	0.7282	0.1382	0.5108	1.1840

3.2. Impact Mechanism Analysis and Testing

First, based on the previously designed econometric model for the impact of new-quality productive forces (Force) on high-quality and full employment (Employ), the calculation results in Table 5 are obtained. It can be clearly observed that as control variables and fixed effects are included in the analysis scope, the goodness of fit of the model continues to improve-this indicates that the selection of control variables and fixed effects in this paper has scientific validity. From the perspective of significance: when only control variables are considered, the impact coefficient of new-quality productive forces on high-quality and full employment is significantly positive at the 1% statistical significance level; in other cases, the coefficient is significantly positive at the 10% statistical significance level. Without considering control variables and fixed effects, for every 1-unit increase in new-quality productive forces, the level of high-quality and full employment increases by 0.8644 units. This shows that new-quality

productive forces have a significant promoting effect on high-quality and full employment, Hypothesis H1 is valid.

Table 5. Benchmark Regression Results

	(1)	(2)	(3)
	High-quality and Full Employment	High-quality and Full Employment	High-quality and Full Employment
New-quality Productive Forces	0.8644* (29.9)	0.8744*** (29.47)	0.657* (1.76)
Control Variables	NO	Yes	Yes
Year Fixed Effects	NO	NO	Yes
Regional Fixed Effects	NO	NO	Yes
Observations	248	248	248
R^2	0.7843	0.7870	0.9923

Notes: Standard errors are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The same applies below.

In the benchmark regression analysis of this paper, although variables that may affect new-quality productive forces (Force) and high-quality and full employment (Employ) have been controlled, endogeneity issues cannot be completely avoided. First, regions with a higher development level of new-quality productive forces usually have a higher economic development level and more vigorous market vitality, which can create more job opportunities and thereby promote the improvement of the regional high-quality and full employment level; conversely, regions with a higher level of high-quality and full employment often have better-quality labor force, and coupled with stronger scientific and technological strength, they will also promote the improvement of their new-quality productive forces level. It can be seen from this that there may be a bidirectional causal relationship between new-quality productive forces and high-quality and full employment. Second, although this paper has incorporated several key variables affecting high-quality and full employment into the model, it still cannot fully control the unobservable variables that simultaneously affect new-quality productive forces and high-quality and full employment, leading to the problem of omitted important variables in the model. Third, the measurement process of the indicators for new-quality productive forces and high-quality and full employment is relatively complex, and in practical operations, problems such as measurement errors, data missing, and data authenticity may be encountered. All the above factors may cause endogeneity issues, which need to be solved by using the instrumental variable method. After reviewing the literature, this paper selects the degree of external connection (Open) as the instrumental variable.

First, the total import and export volume can have an impact on the development of regional new-quality productive forces. If the import and export trade of a region is active, it means that the region has closer external connections, and can absorb advanced foreign technology, capital, talents, and experience more quickly than other regions, thereby providing impetus for the development of new-quality productive forces. In addition, as a core indicator to measure trade activity, the degree of external connection has a natural exogeneity feature, and there is no bidirectional causal relationship with other variables, which can meet the core requirements of instrumental variables. Table 6 presents the results after the endogeneity test. The first-stage regression results show that the degree of external connection is significantly positively correlated with new-quality productive forces at the 1% statistical level, indicating that the correlation between this instrumental variable and the endogenous variable is strong and valid;

the second-stage regression results show that after controlling for endogeneity, new-quality productive forces still have a significant promoting effect on high-quality and full employment.

Table 6. Endogeneity Test

	(1)IV-I	(2)IV-II
	New-quality Productive Forces	High-quality and Full Employment
New-quality Productive Forces		0.1217* (1.74)
Degree of External Connection	0.3539*** (4.68)	
Kleibergen-Paap rk LM	22.36***	
Kleibergen-Paap Wald rk F	21.95	
Cragg-Donald Wald F	79.31	
Stock-Wright LM S	3.7*	
Control Variables	Yes	Yes
Year Fixed Effects	Yes	Yes
Regional Fixed Effects	Yes	Yes
Observations	248	248

On the one hand, considering that a large-scale emergency event occurred worldwide in 2020, this paper takes this perspective and splits the sample periods into two parts-2016-2019 and 2020-2023-with 2020 as the dividing point, corresponding to Column (1) and Column (2) in Table 7 below, respectively. According to the test results, the international emergency event does not change the promoting effect of new-quality productive forces (Force) on high-quality and full employment (Employ); instead, it strengthens the degree of impact between the two. On the other hand, to avoid short-term noise interference and improve the stability of results, this paper conducts first-order lag processing on the panel data. The results in Column (3) of Table 7 show that the promoting effect of new-quality productive forces on high-quality and full employment remains statistically significant, indicating that changes in time do not affect the relationship between the two.

Table 7. Robustness Tests

	(1)	(2)	(3)
New-quality Productive Forces	0.1153* (2.02)	0.1376* (2.05)	0.772* (1.82)
F	4053.88	77856	47376.49
R^2	0.9958	0.9930	0.9940
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Regional Fixed Effects	Yes	Yes	Yes
Observations	124	124	217
cons	0.6483	1.2028	0.6170

Finally, although new-quality productive forces (Force) have a significant positive promoting effect on high-quality and full employment (Employ), restricted by factors such as regional economic foundation and endowment of scientific and technological resources, the development level of new-quality productive forces varies significantly across different regions.

This difference may lead to regional heterogeneity in the impact of new-quality productive forces on high-quality and full employment. To deeply analyze this heterogeneity feature, this paper draws on the research idea of Ru Jiachen et al. [19], divides China's 31 provinces into two groups according to the development level of new-quality productive forces, and tests their impact effects respectively. The regression results in Table 8 show that new-quality productive forces have a significant promoting effect on high-quality and full employment in both groups of regions, but there are obvious regional differences in the intensity of impact: compared with underdeveloped regions, the promoting effect of new-quality productive forces on high-quality and full employment in developed regions is stronger; while underdeveloped regions, restricted by their own development conditions, fail to fully release the potential of new-quality productive forces to drive employment.

Table 8. Heterogeneity Tests

	Developed regions	Undeveloped regions
New-quality Productive Forces	0.9822*** (19.78)	0.7887*** (25.24)
F	39.54	130.30
R^2	0.7883	0.9165
Control Variables	Yes	Yes
Year Fixed Effects	Yes	Yes
Regional Fixed Effects	NO	NO
Observations	192	56
cons	0.0733	0.1593

Note: Underdeveloped regions include: Guizhou, Heilongjiang, Jilin, Inner Mongolia, Ningxia, Xinjiang, Gansu, Qinghai, Tibet.

4. Conclusion and Prospects

This paper systematically analyzes the intrinsic connection between new-quality productive forces (Force) and high-quality and full employment (Employ), and deeply reveals the mechanism of action between them. On the basis of clarifying the core connotations of new-quality productive forces and high-quality and full employment, this paper selects panel data from 31 provincial-level administrative regions in China from 2016 to 2023, constructs a multi-dimensional evaluation index system, and quantitatively measures the development levels of the two variables. Under this premise, the core hypothesis is tested through a benchmark regression model; interfering factors are excluded by combining endogeneity treatment and multi-dimensional robustness tests; and further heterogeneity analysis is conducted to finally accurately identify the impact direction, effect intensity, and heterogeneity of new-quality productive forces on high-quality and full employment. The research results show that:

- 1) New-quality productive forces have a significant positive driving effect on high-quality and full employment, and this effect is stable over time and will not change due to annual differences;
- 2) The impact of new-quality productive forces on high-quality and full employment exhibits sustained resilience-even in the face of the impact of major international emergency events, the direction and intensity of its role remain stable;
- 3) The driving effect of new-quality productive forces on high-quality and full employment shows obvious regional heterogeneity: in regions with lagging development of new-quality productive forces, restricted by insufficient endowment of scientific and technological resources, capital investment gaps, and lack of high-end talents, their positive promoting effect is significantly weaker than that in regions with sufficient development.

Promoting high-quality and full employment is a new positioning and new mission of employment work in the new era and new journey. To promote high-quality and full employment and enhance the people's sense of happiness and gain, it is necessary to firmly grasp the opportunity of new-quality productive forces and take a variety of measures. In view of the above conclusions, this paper puts forward the following targeted suggestions:

(1) Build an endogenous driving force system for the development of new-quality productive forces through the cultivation of the "three new factors" (new laborers, new means of labor, new objects of labor). The core competitiveness of new-quality productive forces stems from the reconstruction of production factors, which requires focusing on the cultivation of new laborers, the innovation of new means of labor, and the expansion of new objects of labor as the core priorities. For new laborers: on the one hand, deepen the integration of industry and education and university-enterprise collaborative talent cultivation to cultivate compound talents adapted to new industries in a targeted manner; on the other hand, improve the new skill evaluation and incentive mechanism, and at the same time build a lifelong learning platform to help traditional laborers achieve skill iteration and address the issue of the "talent adaptability gap". For new means of labor: focus on the threefold goals of "intelligent upgrading + independent control + efficient allocation". Accelerate the R&D and application of high-end equipment, break through core technology bottlenecks to achieve independent innovation, and develop means of labor adapted to new energy and new industries; explore the sharing model of means of labor, build cross-regional and cross-industry sharing platforms, and improve resource utilization efficiency. For new objects of labor: promote the coordinated advancement of "scope expansion + value exploration + standardized utilization". Expand the new scope of labor objects, and improve mechanisms for data confirmation, transaction circulation, and security protection; explore the new value of traditional labor objects, and at the same time develop new green labor objects in the field of clean energy such as wind energy, solar energy, and hydrogen energy; establish a quality standard system for new labor objects, formulate hierarchical and classified standards, and achieve green, low-carbon, and efficient development.

(2) Adapt to local conditions, implement differentiated cultivation strategies based on regional endowments, and actively promote cross-regional collaboration. To promote the balanced development of regional new-quality productive forces, it is necessary to base on the resource endowments and industrial foundations of various regions, focus on "differentiated cultivation + collaborative improvement of weak links", avoid a "one-size-fits-all" approach, and achieve "each giving full play to its strengths and narrowing the gap". The eastern coastal regions need to focus on cutting-edge fields to achieve original innovation, while transferring and spilling over technologies and management experience to the central and western regions, and relocating low-value-added industries; the central and western regions should rely on resources such as wind, solar, and agricultural resources to develop characteristic new industries, undertake suitable industries from the east, and improve new infrastructure. The western regions need to focus on the dual main lines of "transformation of resource endowments + breakthrough of key weak links", convert traditional advantages such as energy, agriculture, and ecology into driving forces for the development of new-quality productive forces, and at the same time address factor bottlenecks through external collaboration and internal upgrading.

(3) Optimize the government-led public employment service system, and transform the employment potential of new-quality productive forces into practical results through systematic optimization and targeted policies. First, build a core employment service system of "accurate matching of supply and demand", connect with the job demands of new-quality productive forces, reshape the employment service process, and make services accurately adapt to the new employment characteristics under new-quality productive forces. Second, strengthen the employment security system of "policy coordination for bottom-line

guarantees", and improve the system for "rights protection of flexible workers": for the flexible employment groups spawned by new-quality productive forces, the government should take the lead in formulating social security measures for flexible employment, and provide them with vocational skills training and entrepreneurship support. Third, improve the service guarantee mechanism of "regional coordination + supervision and evaluation" to ensure the efficient implementation of the system. The government needs to include the effectiveness of public employment services in the assessment indicators of local governments to avoid "focusing on form over actual results"; at the same time, establish an evaluation mechanism for enterprises' "employment social responsibility"-for new-quality industry enterprises that actively participate in targeted training and absorb key groups for employment, provide credit bonus points and policy preferences; on the contrary, strengthen supervision to compel enterprises to fulfill their employment responsibilities.

References

- [1] Xie, Y. (2025). The historical positioning and evolutionary trend of new-quality productive forces: An analysis based on the intergenerational replacement and life cycle of productive forces. *Journal of Jiangxi University of Finance and Economics*, (05), 3-12.
- [2] Tao, L. (2025). The theoretical core and essential attributes of new-quality productive forces from the perspective of historical materialism. *Journal of Shaanxi University of Technology (Social Sciences Edition)*, 1-9 [2025-10-18].
- [3] He, S. (2025). Political economy analysis of "new-quality productive forces being green productive forces in essence". *Journal of Beibu Gulf University*, 1-11 [2025-10-18].
- [4] Zuo, L. (2025). Research on new-quality productive forces empowering the digital transformation of enterprises. *Business Observation*, 11(29), 106-109.
- [5] Li, H., & Du, J. (2025). New-quality productive forces empowering industrial structure upgrading: Impact mechanism and spatial spillover effect. *Journal of Shanxi University of Finance and Economics*, 47(04), 71-83.
- [6] Tong, J., Chen, A., & Long, X. (2024). Labor market integration and the improvement of enterprises' new-quality productive forces. *Journal of Hunan University of Science and Technology (Social Science Edition)*, 27(06), 67-76.
- [7] Zhou, J., & Zang, D. (2025). Fintech empowering the development of new-quality productive forces: Impact effect and mechanism. *Modern Economic Research*, (09), 26-38.
- [8] Lin, L., Zheng, D., & Li, D. (2025). An analysis of the mechanism of population aging affecting new-quality productive forces: A discussion from the perspective of artificial intelligence application and sci-tech finance. *Contemporary Economy*, 1-12 [2025-10-23].
- [9] Chen, Y., & Li, J. (2025). Analysis on the path of promoting high-quality and full employment of college graduates oriented by market demand. *The Science Education Article Collects*, (19), 19-22.
- [10] Yue, C. (2023). The connotation and realization path of high-quality and full employment. *People's Tribune*, (14), 63-66.
- [11] Lai, D. (2022). Promoting Chinese-style modernization through high-quality and full employment. *Chinese Journal of Population Science*, (06), 20-25.
- [12] Lu, Y., Liang, Z., & Qiu, K. (2024). Measurement and quantitative analysis of China's employment level (2010-2021). *Shanghai Journal of Economics*, (01), 88-105.
- [13] Jia, Z. (2023). A study on the impact of digital economy on labor employment [Master's Thesis]. Sichuan University.
- [14] Li, Z. (2019). China's employment policy in 70 years: Moving towards sufficient and quality employment. *Tianjin Social Sciences*, (03), 57-63.
- [15] Chen, J. (2024). Strengthening the protection of the rights and interests of workers in flexible employment and new employment forms. *People's Tribune*, (12), 38-41.

- [16] Zhu, C., Wang, Z., & Zhang, K. (2025). How can new-quality productive forces empower high-quality employment of workers? *Journal of Capital University of Economics and Business*, 27(03), 3-19.
- [17] Yang, H., & Chen, L. (2024). The role of new-quality productive forces in high-quality and full employment. *Studies on Socialism with Chinese Characteristics*, (03), 53-60.
- [18] Lu, J., Guo, Z., & Wang, Y. (2024). Development level, regional differences and promotion paths of new-quality productive forces. *Journal of Chongqing University (Social Science Edition)*, 30(03), 1-17.
- [19] Ru, J., & Ma, Y. (2025). Construction of an evaluation index system for new-quality productive forces based on the entropy weight-TOPSIS method. *Productivity Research*, (05), 24-29.
- [20] Wang, Z., & Zhang, G. (2025). The mechanism and effect of new-quality productive forces promoting high-quality and full employment of the labor force. *East China Economic Management*, 39(06), 46-57.
- [21] Shi, S., Lou, Z., & Liu, J. (2025). A study on the impact of new-quality productive forces on employment scale. *Journal of Xi'an University of Finance and Economics*, 1-14 [2025-10-19].
- [22] Chu, X., & Wang, J. (2025). Embedding in digital global value chains, new-quality productive forces and high-quality and full employment. *Statistics & Decision*, 41(17), 17-22.