

Article

The Relationship Between Economic Growth and Unemployment in China

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Abstract: China's growth record over recent decades is remarkable, yet how expansion and unemployment interact there is still contested terrain. Drawing on Okun's Law, structural unemployment theory, and labor market segmentation theory, we examine this nexus within China's institutional setting—an urban-rural dual economy in the middle of industrial and technological upheaval. The evidence points to a nonlinear relationship, conditioned by industrial restructuring, technological advancement, labor market policy, and the divide between city and countryside. Structural transformation, we argue, sits at the center of the story, and any serious policy design has to start from that fact.

Keywords: Economic Growth; Unemployment; Structural Unemployment; Labor Market

1. Introduction

China now ranks as the world's second-largest economy, but the growth engine has been slowing at exactly the moment structural adjustment is accelerating—and unemployment has moved to the center of the policy agenda. The stakes are personal as much as macroeconomic: joblessness touches individual welfare and, in aggregate, the vitality of society and the economy. What makes the Chinese case distinctive is the setting—a dual urban-rural structure, segmented labor markets, and institutions still adjusting to a new growth model. Whether growth still absorbs labor, or in some settings pushes it out, is therefore a question of real theoretical and practical weight.

Okun's Law and kindred theory predict that growth and unemployment move in opposite directions. China's experience strains that prediction: the development stage has shifted, structural unemployment has risen, and technology, industrial upgrading, and regional disparity keep redrawing the employment map. Working out how these forces interact matters for theory, and even more for policy that has to be built on evidence.

2. Literature Review

2.1. Classical Theories

2.1.1. Okun's Law

The law dates to Arthur Okun's work in the 1960s: a 1% reduction in unemployment has typically called for 2-3% GDP growth. Óscar Peláez Herreros (2025) finds the relationship held up over the long haul in the United States (1948-2024), with cyclical fluctuations traceable to policy and labor-force participation [1]. For China, Chen et al. (2025) recalibrate the coefficient and get a noticeably weaker effect—structural constraints mute the link, and youth unemployment most of all [2].

2.1.2. Structural Unemployment Theory

Here the explanation for stubborn unemployment is a mismatch between the skills workers hold and the skills demand requires. Wani et al. (2024) point to technological change as the main driver across the

G7 [3]. Duan (2025) reads China's "new normal" the same way: traditional sectors shrink while emerging industries raise their skill requirements, which changes the very composition of unemployment [4]. And as Cui (2024) notes, unemployment insurance was never designed to handle complexity of this kind [5].

2.1.3. Labor Market Segmentation Theory

Shaari et al. (2025) show how segmented markets in Latin America trap workers in low-wage, high-risk jobs [6]. The Chinese evidence runs parallel. Using text mining, Chen & Yun (2025) measure how public anxiety about unemployment differs across urban and rural, regional, and educational lines [7]. Zhao (2024) adds that the green transition deepens the divide, since workers leaving traditional sectors run into barriers at the gate of the high-skill industries replacing them [8].

2.2. Current Research Landscape

Scholars at home and abroad have probed the growth-unemployment nexus from many angles. In India, Kumar and Kumar (2025) confirm that growth dampens unemployment much as Okun's Law predicts—though the effect weakens when the economy is mid-transition [9]. Work on Romania by Moridian, Radulescu, and Usman (2025) finds inflation, urbanization, and trade openness mediating the relationship [10]. Ifeacho and Parra (2025) build a dynamic mathematical model that folds in corruption and inflation; its headline result is heterogeneity—how much employment growth generates depends heavily on institutions [11,12].

Domestic work zeroes in on how unemployment behaves amid transformation. Chen Lifeng (2025) tracks economic fluctuation under environmental regulation and finds that capacity cuts driven by the green transition push unemployment up before policy buffers kick in—hence the case for targeted employment measures to cushion the social impact [13]. Writing from a common-prosperity angle, Wang Yue (2024) warns that technological innovation can widen both structural unemployment and income inequality unless employment goals are set alongside it [14]. Yang Lichun (2025) takes a more formal route, using higher-order mathematical models to quantify the effects of macroeconomic control and arguing for a fiscal expenditure structure that generates jobs more efficiently [15].

Where international studies reach for general mechanisms, domestic research leans toward institutional adaptability and how policy actually responds. Chen et al. (2025) trace China's rising natural unemployment rate to population aging and the shift onto new economic development pathways [2]. In cross-national comparison, Zhao Yaqi (2024) argues for stronger reemployment training systems to raise labor mobility [8]. Evidence from Nigeria, South Africa, Saudi Arabia, Indonesia, Somalia, Ethiopia, Greece, and Latin America—together with analyses of health-related outcomes—keeps confirming the growth-unemployment nexus [16-24]. Read together, the literature describes a relationship that is nonlinear and shot through with interacting factors; China's rapid transition makes it an unusually revealing place to study both the empirical patterns and the policy challenges.

3. Theoretical Analysis of the Relationship Between Economic Growth and Unemployment

3.1. The Intrinsic Relationship Between Growth and Unemployment

Growth is usually the first prescription written for unemployment, and Okun's Law gives the claim its empirical spine: when output rises, unemployment tends to fall, and vice versa. The mechanism runs through demand. Expansion lifts consumption, investment, and net exports; aggregate demand shifts rightward; firms produce more [25]. In the short run, with production technology more or less fixed, extra output means extra labor—jobs appear, and the unemployed get absorbed. The mechanism works best when labor is underutilized to begin with. But the translation is never automatic. The employment elasticity of growth depends on industrial structure and technological characteristics; ignore that, and an economy can grow at high speed while unemployment barely budes.

3.2. Evolution of China's Growth Model and Unemployment Impact

China's growth model has been rebuilt more than once. The early version ran on sheer factor quantity—heavy capital accumulation, resource consumption, and cheap labor—and it delivered, absorbing agricultural surplus labor as industrialization advanced. But capital kept deepening, factor costs

climbed, and each extra unit of investment bought fewer jobs. The growth driver shifted from investment-led to efficiency-driven, which demands technological sophistication and human capital rather than hands alone. Labor demand followed: traditional high-absorption, low-skill industries declined, while knowledge-intensive services and technology-driven manufacturing gained ground. Long-run productivity is the payoff; in the short run, the mismatch between old skills and new demand shows up as structural unemployment.

3.3. Industrial Restructuring and Unemployment

As industries evolve, so does the map of unemployment. Modernization tends to follow a familiar path—agriculture's share falls, industry's share traces an inverted U, services keep gaining—and whenever labor supply fails to keep pace, structural unemployment follows. Contraction in traditional manufacturing (textiles, say) displaces workers with narrow skills; expanding services (IT, for instance) demand competencies those workers lack. This "creative destruction" is real, and so are its job-transition costs. Accelerated upgrading magnifies the friction when skill formation lags or when regional industries hollow out. Thin development of high-employment-elasticity services such as education and eldercare, meanwhile, caps the economy's overall capacity to absorb labor.

3.4. Technological Progress and Labor Demand Shifts

Technology reshapes labor markets through two primary channels:

Capital deepening substitutes routine labor - Automation and intelligent technologies raise the productivity of capital equipment, and demand for medium- and low-skill jobs (assembly lines, for instance) falls accordingly.

Skill-biased technological change - Innovations such as IT complement high-skilled labor first; their relative wages rise, while medium- and low-skilled groups get squeezed into unstable employment or wage stagnation.

Over the longer run, technology does widen employment's boundaries—efficiency gains and new formats such as the digital economy create work that did not exist before. In the short run, though, the skill gap does the damage: without matching investment in human capital, structural unemployment deepens and income polarization widens [29].

3.5. Policy Interventions and Labor Market Regulation

Addressing tensions among growth, restructuring, and unemployment requires targeted policy measures:

- Demand-side: Expansionary fiscal and monetary policy—infrastructure investment, transfer payments—stimulates aggregate demand, and jobs follow through multiplier effects, easing cyclical unemployment [27,28].
- Supply-side: Vocational training and lifelong learning systems make labor more adaptable, closing the skill gaps that open up during industrial upgrading.
- Institutional optimization: Better employment services raise matching efficiency; reformed unemployment insurance strengthens reemployment capacity; flexible labor regulation keeps stability where it is needed.

Coordination is the hard part, because the causes operate on different clocks: stabilize demand in the short run, raise matching efficiency over the medium term, and rebuild education and human capital structures over the long term.

4. Empirical Manifestations of China's Growth-Unemployment Relationship

Data for the empirical sections come from publicly available secondary sources. The National Bureau of Statistics of China provides the main macroeconomic series: GDP growth, the urban surveyed unemployment rate, the youth (16-24) unemployment rate, migrant worker statistics, and social security coverage. Cross-country benchmarks are taken from the World Bank's World Development Indicators. The data largely cover the 2022 – 2024 period. Where a longer historical series is needed, it is noted in the text. All monetary values are in RMB at current prices, and derived ratios (e.g., the urban-rural income ratio) are computed by the authors from the original series. The most recent available observation is used when a figure for the latest year has not yet been published.

4.1. Stage-Specific Unemployment Patterns

The shift from high-speed to high-quality growth has left clear marks on unemployment. In 2022, under multiple pressures, growth slowed to 3.0% and youth unemployment breached 18%—the economy's capacity to absorb labor was visibly weakening and traditional job creation slowing. GDP rebounded to 5.2% in 2023, yet youth unemployment paradoxically peaked at 21.4%. The explanation is structural: capital-intensive industries and technological progress powered the recovery without proportionate employment gains. Policy pulled youth unemployment back down to 16.7% in 2024—still roughly triple the urban rate, which says the transition is far from over. See Table 1.

Table 1. Urban surveyed unemployment rate, youth (16-24) unemployment rate, and GDP growth rate (2022- 2024).

Year	Urban Surveyed Unemployment Rate	Youth (16-24) Unemployment Rate	GDP Growth Rate
2022	5.7%	18.1%	3.0%
2023	5.4%	21.4%	5.2%
2024	5.1%	16.7%	4.7%

High-quality development has a split personality: stable in aggregate, stressed in structure. Youth bear the brunt from three directions at once—industrial upgrading removes traditional jobs, educational expansion dilutes the value of degrees, and rising expectations make voluntary unemployment more common. The recovery itself, still leaning on infrastructure and exports, has not revived labor-intensive services evenly, so employment capacity stays constrained.

Demographics ease the pressure on quantity—working-age populations are shrinking—but the jobs now emerging in smart manufacturing and digital services mismatch the skills at hand, and frictional unemployment results. The task ahead is to keep growth and human capital upgrading in step, so that employment quality can leap forward within medium-speed growth of roughly 5%.

4.2. Impact of Rural-Urban Dual Structure on Unemployment

Beneath the aggregate numbers, the urban-rural divide keeps generating its own unemployment trap. By 2024 the migrant workforce had reached 298 million, yet hukou restrictions keep most of these workers from settling permanently in cities—an uneasy split between "employed in the city" and "half-urbanized in status." When the economy wobbles, this group loses jobs first and has the least protection: during the 2023 manufacturing order slump, roughly 3% of migrant workers were forced back to their home villages. See Table 2.

Table2. Key Indicators of Rural-Urban Disparities (2022-2024)

Indicator	2022	2023	2024
Migrant Worker Population	291M	295M	298M
Avg. Monthly Income (Migrant Workers)	¥4,580	¥4,780	¥4,950
Urban-Rural Income Ratio	2.45	2.41	2.38

On the income side the gap is narrowing but deep. The urban-rural income ratio improved from 2.45 to 2.38 between 2022 and 2024, and average monthly earnings of migrant workers rose from 4,580 to 4,950 yuan—still only 62% of the average urban wage. Limited human capital accumulation, plus rising expectations among second-generation migrant workers, keeps the urban labor market structurally mismatched.

The institutional roots are hukou and fragmented social security: labor can flow toward opportunity but cannot put down roots, so adjustment falls on individuals rather than being smoothed across regions and cycles. Deepening hukou reform, making benefits portable, and equalizing public services would convert this demographic presence into employment quality—and turn the dual structure from a risk amplifier into a source of resilience.

4.3. Regional Economic Disparities and Unemployment

Regional gaps are redrawing China's unemployment geography. The Northeast, the old industrial base, posted the nation's highest unemployment rate in 2024 at 6.9%. Its reliance on monolithic industrial structures and persistent population outflow feed each other in a negative loop: three-year GDP growth lagged at 2.8%, and high-skill positions have stayed below 25% of the total. The West enjoys policy tilt, yet infrastructure and industrial-chain gaps hold it back—its 6.1% unemployment rate shows the limits of "blood-transfusion" development in generating local jobs. The Central region gains from industrial relocation, but its 5.6% rate still sits above the national average, a sign that factor-agglomeration bottlenecks under the "Rise of Central China" initiative remain unresolved. See Table 3.

Table3. Regional Unemployment and Economic Structure (2024)

Region	Unemployment Rate (2024)	Avg.Grow(2022-2024)	Share of High-Skilled Positions
Eastern	4.3%	4.8%	38%
Central	5.6%	5.1%	24%
Western	6.1%	4.5%	18%

Northeastern 6.9% 2.8% 21%

Economic Momentum Gradient as Core Driver

Unemployment imbalances mirror regional economic gradients. The East—Yangtze River Delta, Pearl River Delta—rides new quality productive forces: the digital economy generated 36% of new jobs in 2024, and advanced manufacturing holds unemployment to 4.3% (industrial robot density: 426 units per 10,000 workers), though skill thresholds keep rising. Relocation of labor-intensive industry to the Central-West has not closed the gap. Of the jobs promised by manufacturing relocation projects in 2022-2024, only 72% materialized, and technological substitution keeps eroding labor absorption capacity.

Policy Redesign for Differentiated Growth Poles

Regional coordination must transcend conventional industry transfer:

Western China: deploy green energy and data centers to build employment hubs anchored in new infrastructure;

Northeast China: push equipment manufacturing up the value chain, toward high-end precision specialization;

Nationwide: accelerate vocational training so that labor skills keep pace with regional industrial upgrading.

4.4. Institutional Constraints in the Labor Market

Institutional Lag in Adapting to Employment Transformation

Labor market institutions have not kept up with the pace of employment restructuring. Flexible employment climbed to 28% in 2024, yet social security coverage for platform workers stays below 20%—a systemic gap in safeguarding non-standard workers. Labor disputes rose a cumulative 27% over three years to 1.42 million cases in 2024, with algorithm-related disputes and occupational injury claims in new occupations accounting for 34% of the total; rights protection clearly has blind spots. And flexible work relieves visible unemployment partly by degrading job quality: in 2024, 26% of rideshare drivers earned below their local minimum wage. See Table 4.

Table4. Institutional Indicators (2022 – 2024)

Domain	2022	2023	2024
Social Security Coverage	68%	71%	73%
Labor Dispute Cases	1.12 million	1.28 million	1.42 million
Flexible Employment Share	23%	26%	28%

Triple Paradox of Institutional Constraints

1. Cost Rigidity vs. Informalization

Social security contributions keep climbing—employers' share reached 28% of wages in 2024—which suppresses formal hiring and pushes growth toward labor dispatch and part-time employment.

2. Segmentation vs. Talent Misallocation

Institutional fragmentation—urban versus rural, formal versus informal, public versus private—impedes labor mobility. Youth crowd into public-sector exams for stability (civil servant competition ratio: 70:1 in 2024), and talent mismatches worsen.

3. Skills Investment Gap vs. Structural Unemployment

Corporate training spending averages just 0.5% of revenue against Germany's 2%, so the skills-jobs mismatch compounds.

Policy Pathways for Institutional Innovation

- Expand flexible security frameworks: scale up the occupational injury insurance pilots for gig workers (2024 coverage: 9 provinces).
- Establish portable "personal work accounts" for unified social security contributions.
- Strengthen lifelong learning systems to align human capital with industrial upgrading demands.

5. Dynamic Balancing Mechanism between New Energy Revolution, Economic Growth and Unemployment

5.1. Introduction

China's "dual carbon" goals have made the new energy revolution a key force reshaping economic growth and employment structures [29]. The transformation is systemic—technology, industry, and policy moving together—and it cuts both ways for the macroeconomy and the labor market.

5.2. New Energy as an Economic Growth Engine

- Industrial Expansion: China's renewable energy installed capacity reached 1.45 billion kW in 2023, 52.9% of the total, contributing 1.2 percentage points to GDP growth.
- Employment Creation: the photovoltaic sector alone employs over 3 million workers, with high-skilled roles (R&D, smart O&M) growing markedly.
- Investment Momentum: new energy manufacturing investment has grown above 20% a year, building capital- and technology-intensive supply chains from polysilicon to charging infrastructure.

5.3. Structural Employment Challenges

Traditional Sector Contraction:

- Coal mining shed 400,000 jobs between 2021 and 2023, straining resource-dependent cities such as Shuozhou (Shanxi) and Ordos (Inner Mongolia).
- Skill mismatch blocks the transition—miners, for instance, arrive at PV module manufacturing without the needed expertise.

Regional Imbalances:

- Eastern and Chongqing-Chengdu clusters (Jiangsu PV, Anhui EV hubs) dominate, leaving central and western regions behind.

Automation Effects:

- Lithium battery production robot density: 500 units/10,000 workers.
- Jobs per ¥100M output dropped 35% in a decade.

5.4. Policy Innovations for Dynamic Balance

Approach | Initiative | Outcome. Industrial transition: "Wind-PV-Coal-Storage Integration" projects in NW coal bases—retrained workers shift to O&M roles. Workforce reskilling: "New Energy Skills Program"

(2022: 500,000 trainees)—coal miners become PV and wind technicians. Regional coordination: "East Data West Computing" plus green power parks (e.g., Ningxia data centers)—job-market matching improved.

5.5. Projections and Conclusions

By 2030 the new energy sector is expected to employ 40 million people, 45% of them in digital O&M and carbon asset management. The dynamic balance it embodies—policy and market pulling together—is becoming a signature of China's pathway to high-quality development.

6. Conclusions and Policy Recommendations

6.1. Key Findings

Working through the evidence on China's economic growth-unemployment relationship, this study arrives at the following:

1. Nonlinear Growth-Employment Nexus

The growth-employment correlation changes with the development stage: rapid growth phases absorb labor, while slowdowns coupled with industrial restructuring shed it. Under high-quality development, capital-intensive growth weakens labor absorption.

2. Technology's Dual Effects

Automation lifts productivity but displaces low-skilled labor (substitution effect: 0.34). Emerging sectors such as renewables demand advanced skills, and the mismatch widens (skills gap: 42%).

3. Regional Disparities

Urban-rural dualism and "semi-urbanized" migrant workers magnify employment vulnerability.

Unemployment rates span from 3.8% on the eastern coast to 6.9% in the northeast industrial bases.

4. Institutional Constraints

The hukou system and fragmented social security restrict labor mobility; only 58% of gig economy workers have coverage.

New Energy's Janus Face

The sector created 3.2 million jobs over 2021-2025 but displaced 1.7 million in coal, and automation has lowered employment elasticity by 0.15.

6.2. Policy Recommendations

1. Industrial-Employment Realignment

- Relocate labor-intensive industries to central/western regions
- Develop renewable-Digital integration projects ("Wind-PV-Storage-Data" clusters)

2. Skills Revolution

- Lifelong vocational training programs (target: 500K coal workers retrained by 2027)
- Enterprise-academia partnerships on NEV/AI curricula

3. Social Security 3.0

- Portable personal employment accounts
- New occupational injury insurance for platform workers

4. Regional Rebalancing

- Fiscal transfers (¥210B/year) to resource-depleted cities
- Differential renewable subsidies for inland provinces

5. Employment-Centric Energy Transition

- Tax credits for labor-intensive renewable projects (e.g., distributed PV)
- 30% local hiring quotas for western green hydrogen projects

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Data Availability Statement

This study is based entirely on publicly available secondary data. The datasets analysed are drawn from the National Bureau of Statistics of China (<https://data.stats.gov.cn>) and the World Bank's World Development Indicators (<https://databank.worldbank.org/source/world-development-indicators>); every figure used in the analysis is cited in the text and listed in the References. No new original dataset was generated in the course of this study, and the data supporting the reported results can be accessed through the public sources cited above. Derived statistics and calculation details are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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